

February • 1955

Finish

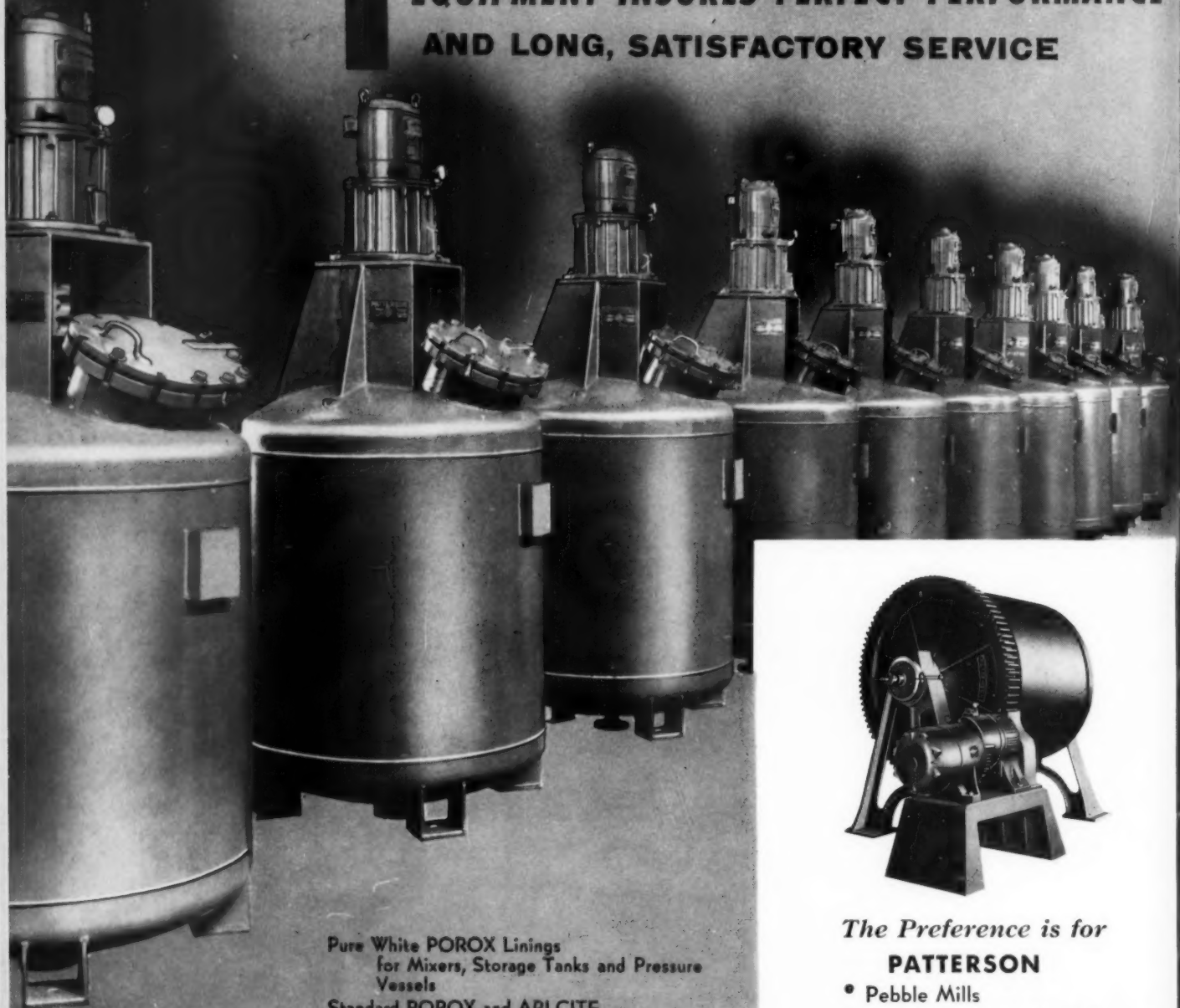
THE MAGAZINE OF
Appliance AND
Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

For your grinding and mixing

Patterson

**EQUIPMENT INSURES PERFECT PERFORMANCE
AND LONG, SATISFACTORY SERVICE**



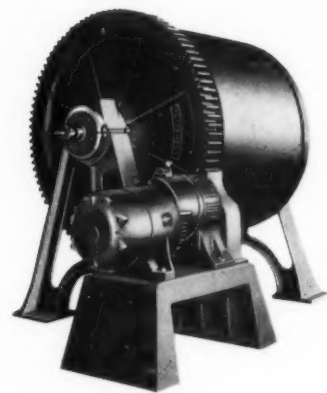
Pure White POROX Linings
for Mixers, Storage Tanks and Pressure
Vessels

Standard POROX and ARLCITE
High Density Mill Linings

POROX Grinding Balls—all sizes

ARLCITE High Density Grinding Balls

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The Preference is for
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- Agitated Pressure Vessels
- Mixers
- Agitated Storage Vessels
for Modern Enameling

The Patterson Foundry and Machine Company
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The Patterson Foundry and Machine Company, (Canada) Limited
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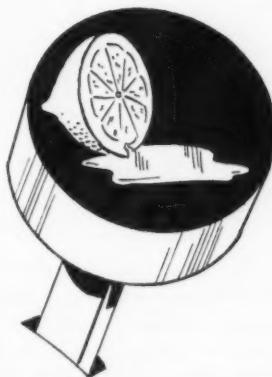
Why Porcelain Enamel puts more **SELL** INTO YOUR PRODUCTS

A porcelain enameled finish on your products offers so many unusual advantages that it **stands out** as a sales-aid in comparison with other finishes. And no wonder! What other finish can compare with all these features:



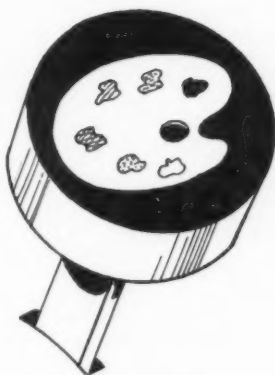
HEAT-RESISTANT

Forgotten cigarettes or even hot irons don't harm its hard, glossy surface. Since it is processed at 1550 F, porcelain enamel will withstand any temperature it is likely to encounter in home service.



RESISTS ACIDS

Acid-resisting porcelain enamel is not damaged by fruit juices or chemicals commonly used in the home.



COLOR PERMANENCE

Porcelain enamel never "fades out." It can be supplied in any color and in any variations of shades.



EASY TO CLEAN

There are no tiny surface pores in porcelain enamel to collect dirt and moisture. So dirt and stains are easy to wipe off.

Of course, the metal beneath the porcelain enamel surface must have excellent bonding qualities, flatness, and uniform fabricating characteristics. That's why more manufacturers have used more Armco Enameling Iron over a longer period than any other enameling base. That is why too it has become known as the "World's Standard Enameling Iron."

Armco Steel Corporation

4974 CURTIS STREET, MIDDLETOWN, OHIO



SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

**a practical approach
to pressroom modernization**

Announcing
TWO NEW  PLANS
to solve press obsolescence problems

The extensive capital expenditures required to meet competitive pressures have put many manufacturers in an unfortunate position. Modernization is necessary if the manufacturer is to price his product competitively and still make a fair profit. However, the fair profit is necessary before he can afford the modernization. Two new Verson plans make it possible to modernize now and pay for it out of the increased profits it provides. If you are one of the manufacturers faced with the dilemma of needing modernization for better profits, but needing better profits before you can afford modernization, one of these plans may be the answer to your problems.

Customized

INSTALLMENT PROGRAM

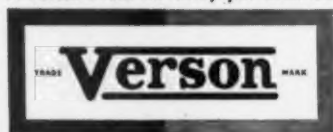
For the manufacturer who wishes to own his own presses but minimize his initial capital outlay, Verson offers a Customized Installment Program. It is called "Customized" because the payment plan is tailored to the buyer's own financial requirements rather than to a single fixed plan. Initial payments may be as low as 10 per cent of the purchase price with the balance payable over periods ranging from six months to five years. Further information on a plan to meet your needs will be furnished on request. Please outline your requirements.

Customized

LEASING PROGRAM

For the manufacturer who wants the advantages of modern, efficient presses without capital investment, Verson offers a Customized Leasing Program. Like the Installment Program, a choice of plans is available to best suit the buyer's requirements. In addition to the basic plans, options for continuation, termination and eventual purchase are also available. Special arrangements for special machines will be considered. Further information on a leasing plan to suit your needs will be furnished on request. Please outline your requirements.

A Verson Press for every job from 60 tons up.



ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • Verson-WHEELON HYDRAULIC PRESSES

February • 1955

VOL. 12 • NO. 2

finish

MONTHLY TRADE PUBLICATION

Established January 1944

Published by

DANA CHASE PUBLICATIONS

York Street at Park Avenue

Elmhurst, Illinois

Telephone • TErrace 4-5280

TErrace 4-5281

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is \$5.00 per year, domestic. To all other countries \$8.00 per year (U.S. funds).

Editor and publisher • DANA CHASE
Associate editor • MATT E. HEURTZ
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Circulation manager • LEONARD CORDA

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Accepted under the act of June 5, 1934, at Aurora, Illinois, authorized January 7, 1948.

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DANA CHASE PUBLICATIONS

PRINTED IN U.S.A.

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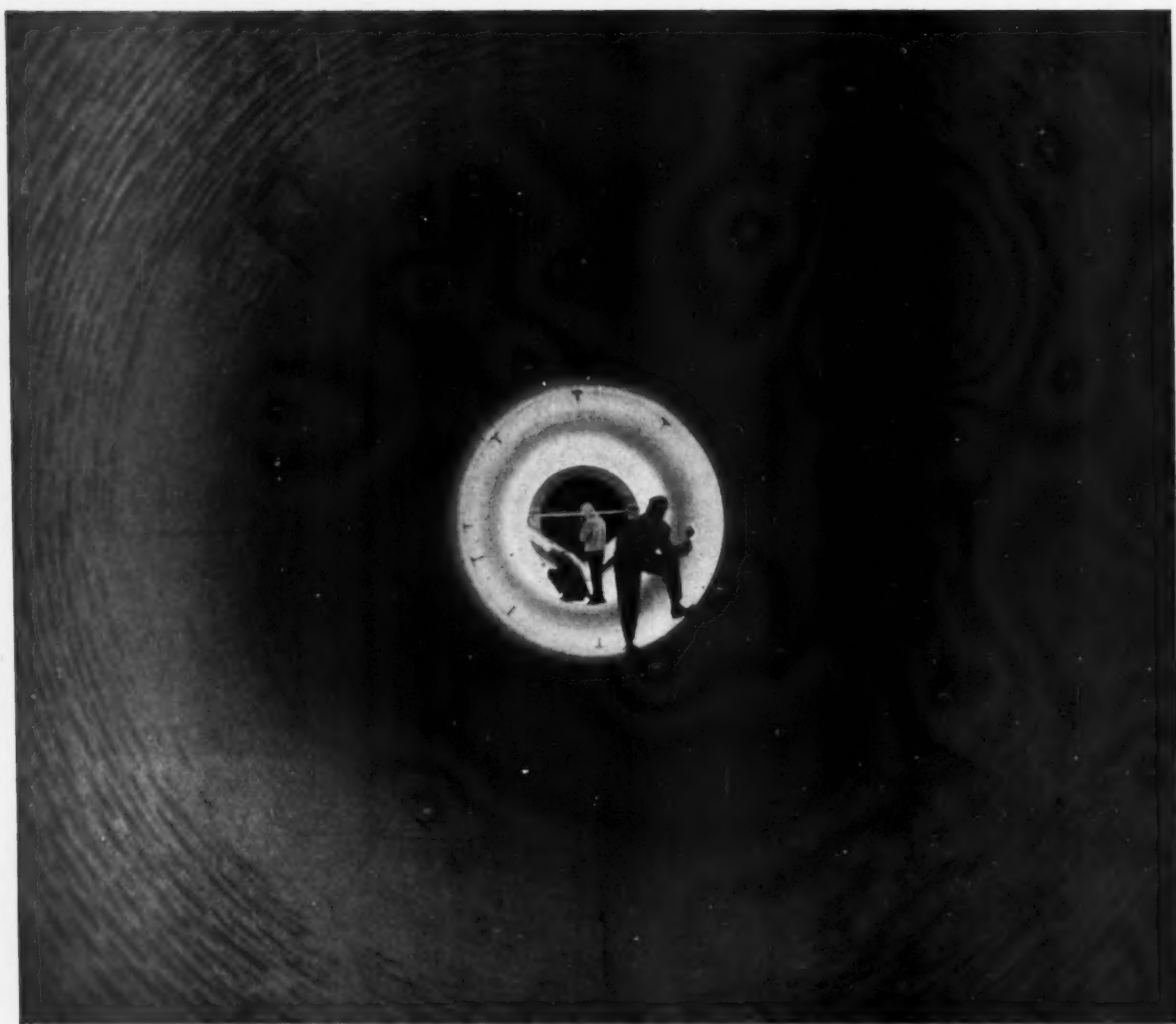
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BPA

NBP

finish

METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT



bull's-eye for quality

The huge calciner shown here is just one part of the TITANOX quality story. In this mammoth rotary kiln, titanium hydrate is converted to titanium dioxide. It is one of the last steps in a carefully controlled process which yields the uniformity of composition, easy working qualities, low shrinkage and free flow which are characteristic of TITANOX-TG and TITANOX-TG-400—non-pigmentary titanium dioxides made exclusively for ceramics.

Smelted into titania porcelain enamels, TITANOX-TG produces maximum opacity while TITANOX-TG-400 yields a blue-white tone. Recent research indicates that glazes can be self-opacified by titanium dioxide through the use of TITANOX-TG. Further, TITANOX-TG is invaluable in promoting acid resistance in dry process enamels as well as enamels for aluminum and glass decorating. Both the anatase and rutile

types of TITANOX titanium dioxide pigments are widely used as mill-added opacifiers.

Your TITANOX representative and our Technical Service Department are always ready to help you make the proper choice. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

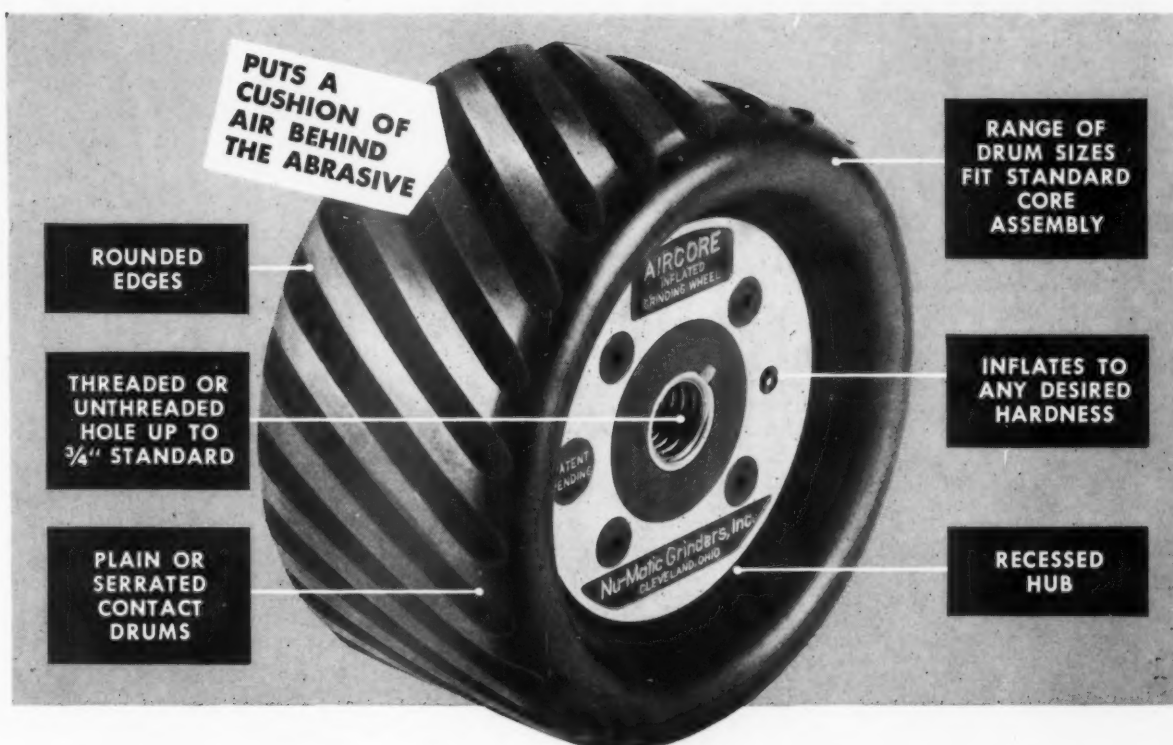
TITANOX

brightest name in the finish

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY





New Aircore Grinding Wheel cuts faster... features interchangeable contact drums

One universal core assembly and a range of contact drum sizes — these are the ingredients for a new line of Nu-Matic Air-Inflated Grinding Wheels. Changing contact drums is like changing from conventional tread tires to snow tread tires on your car. The new Aircore models provide these features:

FASTER FINISHING—With an Aircore Grinder, you get up to 3,000% greater abrasive contact area than with hard-wheel grinders. Means a greater area finished with each pass.

BETTER WORK—No herringbone patterns. No swirl marks. Aircore Grinder produces a smooth, straight-pattern finish comparable to a hand finish. Rough cutting and blending in one operation.

INCREASED BELT LIFE—Users report savings in abrasive costs up to 80%. Fewer grit sizes required in most cases.

FOLLOWS CONTOURS—The resilient contact drum shapes itself to the contour of the work surface — combines contouring with fast, smooth cutting.

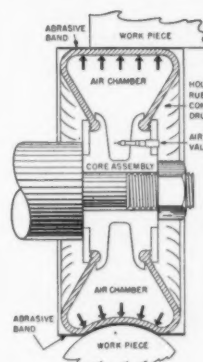
LIGHT WEIGHT—The Model 525 weighs only 15 ounces. Size for size the lightest grinding wheel on the market.

COMPARE AT OUR EXPENSE—Send for 25-day free trial. Give job requirements and type and size power tool used.

NU-MATIC GRINDERS, INC.

8224 Carnegie Ave.

Cleveland 3, Ohio



The Nu-Matic Air-Inflated Grinding Wheel is built like an auto tire — flattens out at point of contact — contours to work surface.



Here you see the large grinding area that an Aircore gives on flat surfaces. A sheet of glass is pushed against an Aircore wheel that has been inflated to 3 pounds pressure.



**you need ... LARGE AND MEDIUM-SIZED
SEAMLESS STAMPINGS**

**We offer ... SKILL ... MEN ... MACHINES ...
plus complete finishing and assembly facilities**

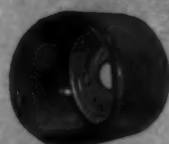
Send for your free copy of
our booklet—"Science and
Skill in Sheet Metals."
It illustrates many jobs
produced for G. P. & F.
customers ... and gives
interesting information on
our abilities and facilities.



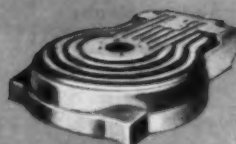
G.P. & F.

Do you have a metal product—or a part of a product—that has to be stamped or drawn? Then it's time to take a good look at what G. P. & F. has to offer. We have the manpower, the machines, the facilities. We can handle your *complete* job from start to finish—relieve you of production details and responsibilities—even package and ship your finished product, if you wish. The booklet shown on the left tells the complete story. Write for it today!

**Here are just a few
samples of our work...**



**OVERFLOW TUB FOR AUTOMATIC
WASHING MACHINE**
Welded Construction
Vitreous Enamel
Height, 21"—Diameter, 24"
(Also conventional and spin tube)



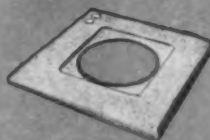
BASE FOR POWER LAWN MOWER
Seamless Drawn Steel
Length, 26"—Width, 19 1/4"
Height, 4 3/8"



**AMMUNITION BOX
(U.S. ORDNANCE)**
Carbon Steel—Spray Painted
Length, 10"—Height, 7"
Width, 3 3/4"



POWER TOOL SAFETY GUARD
Seamless Drawn
Length of Cover, 29 3/4"
Height of Cover, 5 1/4"
Width of Cover, 10 1/8"



**TOP FOR AUTOMATIC
WASHING MACHINE**
Stainless Steel and
Vitreous Enamel
Length, 26"—Width, 25"
Height, 2 1/2"
(Also dryer tops)



SYRINGE HOLDER
Stainless Steel Box, Cover
and Rack
Length, 8 1/4"
Height and Width, 5"



BASE FOR SWIVEL CHAIR
Seamless Drawn Carbon Steel
Length, 25"—Height, 4"



COMMERCIAL HAND DRYER
Seamless Drawn—Vitreous Enamel
Length, 12"—Width, 10 1/8"
Height, 6 1/4"

GEUDER, PAESCHKE & FREY CO., 1605 W. St. Paul Avenue, Milwaukee 1, Wisconsin

THE **finish** **LINE**

finish, too, can look to 1955 with optimism. January '55 was our 3rd largest issue in over 11 years of publication. This February issue is our largest, carrying more editorial and advertising pages than in any preceding month.

FORECASTS FOR THE FUTURE—become increasingly important to the Appliance and Metal Products Manufacturing field as we swing deeper into a period of real competition.

The editors of *finish* make few predictions and use no crystal ball for the determination of business forecasts. We do attempt to keep our readers well posted concerning the thinking of management and statistical experts within the field we cover. Our February issue is selected for the first of these reports as it allows time for the preceding year's developments to be surveyed carefully as a basis of forecasts for the succeeding months.

On this page we present just a few brief comments by important people as a guide to more complete reports in other sections of the issue and to additional statistical information which will appear in later issues.

GAMA—Gas Appliance Manufacturers Association reports that at the end of 1954 the gas industry served a total of 33,156,200 residential customers. (73.2% over 1941). In 1954 alone, 17,500 miles of our pipelines were added to the industry's system. Gas utilities and pipeline construction expenditures are estimated at more than \$1,100,000 during this year. The industry expects to add 1,200,000 new house heating customers in each of the next three years.

Gas appliance and equipment manufacturers expect 1955 volumes to be in tune with forecasts for industry as a whole. Estimates covering five major gas appliances show expected volume to be up an average of 4% in 1955 over 1954. Estimated percentages may be materially higher if individual manufacturers perform up to expectations. (see GAMA report to *finish* on p. 26)

NEMA—National Electric Manufacturers' Association reports 1954 as the second best year in history for the Electrical Manufacturing Industry and predicts an increase in Industry shipments of 5% for 1955 with the possibility of a new high in excess of the all-time peak of \$16.4 billion. Appliances were down 10% for 1954, with some low saturation items showing gains. "It is expected that for the coming year of 1955 most of this loss will be regained (*for items showing loss*) with an overall increase of approximately 6%." (see NEMA report to *finish* on p. 27)

AHLMA—American Home Laundry Manufacturers Association—Factory sales of home laundry equipment (washers, dryers and ironers) passed the mark of 4,000,000 units in 1954 for the second successive year.

Predictions by AHLMA division chairmen point to the sale of 2,725,000 automatic washers in 1955 and that clothes dryers may hit the "magic million" mark this year.

An industry survey indicates that many companies are planning plant and equipment improvements during the year. (see report on AHLMA annual meeting p. 30)

SKCMA—Steel Kitchen Cabinet Manufacturers' Association—After an early 1954 decline in the sale of durable goods generally, Steel Kitchens recovered rapidly and strongly in the closing months of the year. As a result, latest figures indicate Steel Kitchen Cabinet sales for 1954 will total only 2% off the industry all-time peak of 178,000,000 of 1953.

The Steel Kitchen Cabinet industry confidently looks to 1955 as a year of rising sales volume, which very well

could produce a 10% gain to a new high in Steel Kitchen Cabinet sales.

United States Steel Corporation—Benjamin F. Fairless, chairman of the board . . . steel output for 1955 should be approximately 10 million tons higher than that averaged during World War II. 1955 will run about 95 million tons, the fourth highest tonnage of all time.

U. S. S. will complete a new research center near Pittsburgh during 1955.

Armco Steel Corporation—W. W. Sebald, president . . . steel used by manufacturers during 1954 was about 96 million tons (in terms of ingots), 8 million tons more than was produced. Steel production during 1955 should rise to 95 to 100 million tons.

Armco plans to spend about \$30 million in 1955 to improve plants and equipment.

Inland Steel Company—Joseph L. Block, president . . . with the tremendous growth of the automotive household appliance and metal container industries, steel has become a consumer goods industry to an even greater extent than a capital goods industry. Therefore, it can lay just claim as a pulse-taker to the entire American economy.

Barring serious strikes in major industries, ingot production is likely to hit at least 100 million tons in 1955.

What the individual manufacturers say: Year end reports and forecasts from dozens of manufacturers throughout the Appliance and Metal Products field present the same general story: 1954 was a good year for most companies, and the forecasts for '55 are almost unanimously for a production gain of from 5% to 15% with the extremes running from 1% to 30%.

Our editors have also been conducting a personal survey among the key management and sales personnel of Appliance Manufacturing firms. A few of the pertinent reports are included with the report of the Chicago Market starting on p. 33.

Another significant point aside from production and sales forecasts is in the number of manufacturers who have reported to *finish* their plans for continued plant modernization. Expansion plans are also very much a part of the 1955 picture.

What about color

The report on the current color trend is too comprehensive to be presented in this brief editorial. You may get a few pointers by reading the Market report (starts p. 33). In later issues we will continue to report on this important subject.

Our prediction

Our readers will notice that so far in this *finish line* we have confined the report to the opinions and predictions of others—men who are in excellent position to feel the pulse of industry.

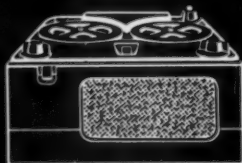
One prediction we *will* make, without reservation, those companies which are successful in making the predicted increases materialize for their respective companies *at a profit* will be the ones that have been and currently are giving top rating to Sales Personnel, Sales Training, (at all levels) Sales and Advertising Plans, and every important ingredient of the field of MERCHANDISING.

Dana Chase

EDITOR AND PUBLISHER

PREVENT RUST with MACCO BLUCOAT

*the amazing
between-operation
rust proofing
solution*



RECORDER precision parts are being given the Macco Blucoat Rust Preventive treatment by one of the nation's leading electronic manufacturers.



GEARS cut, ground and tempered are treated with Blucoat to prevent rust during storage, shipping and assembly.



CARBURETOR bodies and large engine castings being treated with Macco Blucoat to prevent rust after machining and during storage.



AUTO bodies of one of the world's largest body manufacturers are given the Blucoat treatment to prevent rust before painting.

*MACCO CASE HISTORY

Blucoat is the almost unbelievably efficient and time-tested rust preventive used by leading metal processors and fabricating manufacturers the country over. They endorse its use as the only practical method of preventing rust between production operations and assembly—and during interplant transportation and storage.

5 REASONS FOR BLUCOAT'S NATIONAL ACCEPTANCE:

1. Blucoat is water soluble, making it economical, yet extremely efficient.
2. Blucoat is adaptable to an almost unlimited variety of applications and conditions.
3. Blucoat's powerful rust inhibitor works equally well on steel, cast iron, forgings or die castings.
4. Blucoat leaves no oily film—adheres better to metal—collects less dust, chips, etc.
5. Blucoat has withstood perfectly a salt spray test of more than 80 hours. Vastly superior to soluble oil, it contains no poisonous elements. No alcohol, making it exceptionally stable.

For the prevention of rust, Blucoat positively has no equal. Whether the product be the finest of automobile bodies or simply bale tie-wires, Blucoat's versatility makes it most indispensable for any metal processing plant.

Write today or call a Macco sales engineer. Phone Prescott 9-0800, Chicago.

*Actual Case History available on request.

MACCO
PRODUCTS COMPANY

9210 SO. SANGAMON STREET • CHICAGO 20, ILLINOIS

problem....HOW TO CUT STEEL COSTS



Both systems begin with mill coil. However, if you are now buying sheet you are faced with the following costs.



For mill cutting to random lengths, simply shearing to reach sheet form, add \$.20 per hundred weight to basic steel cost.



For squaring to tolerance at the mill add another 10 percent to your basic steel costs.



Then for wrapping and palletizing to keep the sheet clean and easy to warehouse add an additional \$.025 to the costs.

The steel, of course, must be delivered regardless of form.

solution....A WEAN SLITTING and SHEARING



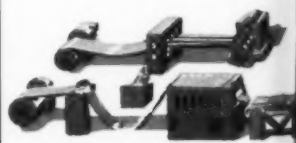
With the Wean system you buy coils, simply prepared . . . eliminate mill extras. Delivery is of comparatively few width sizes.



The fewer sizes . . . the smaller purchasing and inventory staffs required.



And you save approximately 30 percent in storage area.



The Wean Line converts the coil of steel to resquared multiples at rates up to 200 feet (or 100 cuts) per minute. Tolerance control is easily held within accepted

Actual Savings in Steel Costs of 20%

To many steel fabricating people this amazing speed of cutting-to-length to resquared tolerances has seemed unbelievable. But, to many others, who have seen one of these Wean lines in operation, talked with people who operate them, gone over actual figures, this is a production line "must".

When we say savings up to 20 percent in your steel costs we mean just that. Total up the costs approximated above . . . check them against the book . . . against your own cost sheets. Find out what you're paying for getting steel from coil to final sheet size, ready to form. If it's more than a dime a hundred weight then you should know all about the Wean line. Get in touch with one of the offices listed below and let a qualified Wean representative work with you — using your figures if you wish — in proving the Wean line can effect a substantial savings where you and your operations are concerned.

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→ from Page 7

PMI wire report

To finish

THE PRESSED METAL BUSINESS, ACCORDING TO GOVERNMENT FIGURES AND THE SAMPLING WE MADE FROM OUR MEMBERS, SHOWS A 30% DROP IN 1954 COMPARED TO 1953. EVEN THOUGH THE GENERAL FORECASTS FOR ALL BUSINESS ARE VERY OPTIMISTIC FOR 1955, THE BEST STAMPERS CAN LOOK FOR ON AVERAGE FOR THE ENTIRE INDUSTRY IS A 5% IMPROVEMENT DURING 1955.

R. A. DASCHNER
ACTING MANAGING DIRECTOR
PRESSED METAL INSTITUTE

Market survey

→ from Page 35

Avco—"Sales last year were about the same as in '53. However, for '55 we anticipate a 10% increase, with our new refrigerator and the Duo-matic washer-dryer as the leaders. Our latest addition to our appliance line is a built-in electric range.

"We have introduced kitchen cabinets with a "copper glow" color, and are considering other colors for cabinets." — **G. E. Simons**, dir. of adv. and sales promotion, **Crosley** and **Bendix** divisions.

Tappan Stove—"In this our diamond jubilee year, we have a 30% increase budgeted for our sales force. Our sales in '54 were the same as in '53, but profits were less.

"At the top of our line is the new Greenbrier gas range which is in the \$475 class. It has four-in-a-line back burners so there is no working over heat. It also features 'charcoal' radiant broiling.

"Our built-in line features Copper-loy and Lusterloy metallic finishes, with interchangeable parts. The built-in ovens and surface units fit standard Youngstown, Republic or Tracy free-standing kitchen cabinets." — **A. B. Ritzenthaler**, vice president of sales.

Amana Refrigeration—"Sales of Amana freezers in each of the past 10 years have eclipsed the preceding year, with '54 volume up 30% over '53. We wound up the past year with practically "O" inventory at our plant and currently have the largest back order for freezers in our history.

"We entered the room air conditioner business last year and had a very successful year, ending up the year with practically no inventory." — **E. L. Hinchliff**, sales manager.

finish FEBRUARY • 1955

"Automated"



Coining Press Slashes Sizing and Straightening Costs for Leading Automobile Builder

When a leading automobile manufacturer wanted to cut production costs on a forged steel lever Warco engineers worked with them in designing and building a 250-ton coining press with a chain type feed to automatically size and straighten the levers at a speed of 30 finished pieces per minute.

Front loaded, the press will size and straighten either left or right hand lever without change in dies or feed. It has reduced the production time of this part by more than one-half and has provided a safer, less fatiguing job for the operator.

Warco is constantly working out faster, less expensive and safer press production methods. Why not call them in the next time you are in the market for cost-cutting press equipment?

● Automatic feed that boosts production by 100 per cent.

● Left and right hand forged steel levers are sized and straightened on the same press without changing die or feed.

Federal WELDERS

Warco PRESSES

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Try Century Vit TITANIUM WHITE



1. COLOR STABILITY
2. HIGH REFLECTANCE
3. HIGH OPACITY

4. GLOSS
5. TEXTURE
6. WORKABILITY

With Century Vit Titanium cover coat over Century Vit ground coat enamel you have an unbeatable combination for adding beauty and durability to your appliance or other metal product.

Century frits are time proved in production plants before they are sold to you. The titanium frits give you the six characteristics: color stability, high reflectance, high opacity, gloss, texture and workability, so important to your plant and finished product.

Then too — you will save money 1) in frit cost and 2) on the production line.

A Century field engineer can show you how to improve your product and save money too if you will let us hear from you now.



CENTURY VITREOUS ENAMEL COMPANY

6641-61 S. Narragansett Ave., Chicago 38, Ill.

THE finish *spotlight*



Caloric's double-duty automatic gas disposer features a foot pedal which makes it easy for the homemaker to open the loading door with both hands full. A special feature, the Calor-A-Set dial, controls dehydration of the incinerator and permits the unit to be set automatically to handle exceptionally wet refuse as well as dry materials. The disposer is insulated with fiber glass bonded with aluminum foil.

HOMMEL CERAMIC MASTERPIECE SERIES™



HOMMEL MATERIALS MAKE

Masterpieces

Sales representatives throughout the world

THE O. HOMMEL CO. PITTSBURGH 26, PA.

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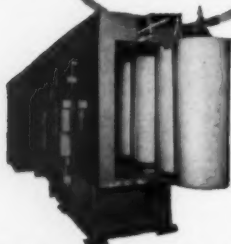
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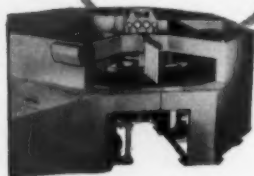
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INDUSTRY MEETINGS

MECHANICAL ENGINEERS

American Society of Mechanical Engineers, founding anniversary meeting, New York City, February 16.

KITCHEN CABINET MEETING

Steel Kitchen Cabinet Manufacturers Association, quarterly meeting, New York City, March 9.

PEI WEST COAST MEETING

Porcelain Enamel Institute, West Coast conference, Biltmore Hotel, Los Angeles, March 10-11.

ASTE WEST COAST MEETING

American Society of Tool Engineers, annual meeting and first western industrial exposition, Shrine Auditorium and Exposition Hall, Los Angeles, March 14-18.

METAL STAMPERS SYMPOSIUM

Pressed Metal Institute, annual spring technical meeting, Hotel Carter, Cleveland, Ohio, March 16-18.

WORLD PLASTICS FAIR

World Plastics Fair & Trade Exposition, National Guard Armory, Exposition Park, Los Angeles, April 6-8.

LP-GAS CONVENTION, EXHIBIT

Liquefied Petroleum Gas Association, annual convention and exhibition, Conrad Hilton Hotel, Chicago, May 1-4.

MATERIALS HANDLING SHOW

National Materials Handling Exposition and Conference, International Amphitheatre, Chicago, May 18-20.

PEI MID-YEAR CONFERENCE

Porcelain Enamel Institute, mid-year division conference, Edgewater Beach Hotel, Chicago, May 18-20.

BASIC MATERIALS EXPOSITION

Annual Basic Materials Exposition, Convention Hall, Philadelphia, May 31-June 3.

CANADIAN COATINGS MEETINGS

Chemical Institute of Canada, protective coatings division conference, Royal York Hotel, Toronto, February 24.

AWS WELDING SHOW

American Welding Society, annual welding show, Municipal Auditorium, Kansas City, Mo., June 8-10.

KITCHEN CABINET MFRS. MEETING

Steel Kitchen Cabinet Manufacturers, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., June 2-4.

APPLIANCE INST. MEETING

Institute of Appliance Manufacturers, annual meeting and suppliers' exhibit, Netherland Plaza, Cincinnati, June 6-8.

INDUSTRIAL FINISHING SHOW

American Electroplaters' Society, annual convention and industrial finishing exposition, Public Auditorium, Cleveland, June 20-23.

SUMMER FURNISHINGS MARKET

Summer Homefurnishings Market, The Merchandise Mart and American Furniture Mart, Chicago, June 20-30.

ASTM ANNUAL MEETING

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, June 26-July 1.

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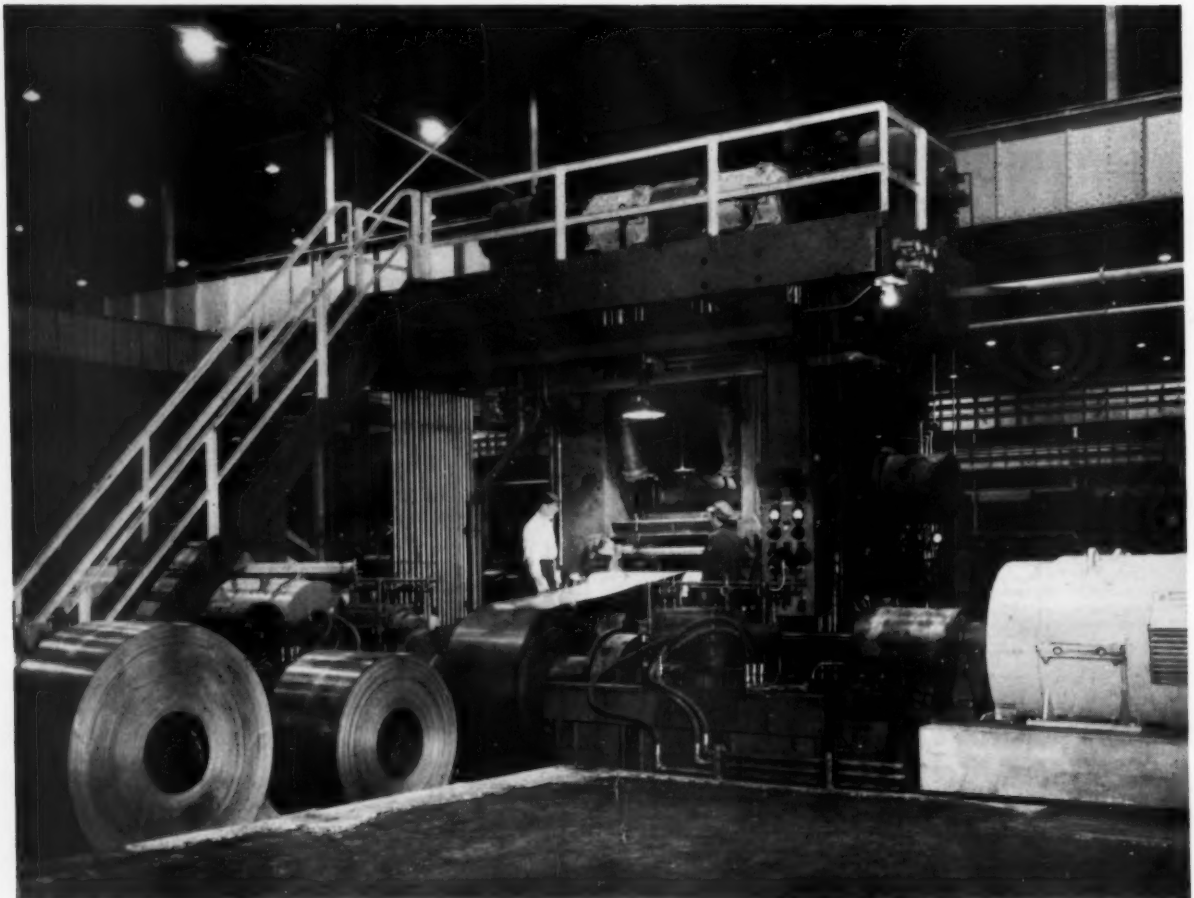
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General Water Heater installs high speed production line

illustrated with finishfotos

by Gilbert C. Close • WESTERN EDITOR



Fully automatic electronic production lines are as inevitable as atomic power, though years may pass before we see either in full operation.

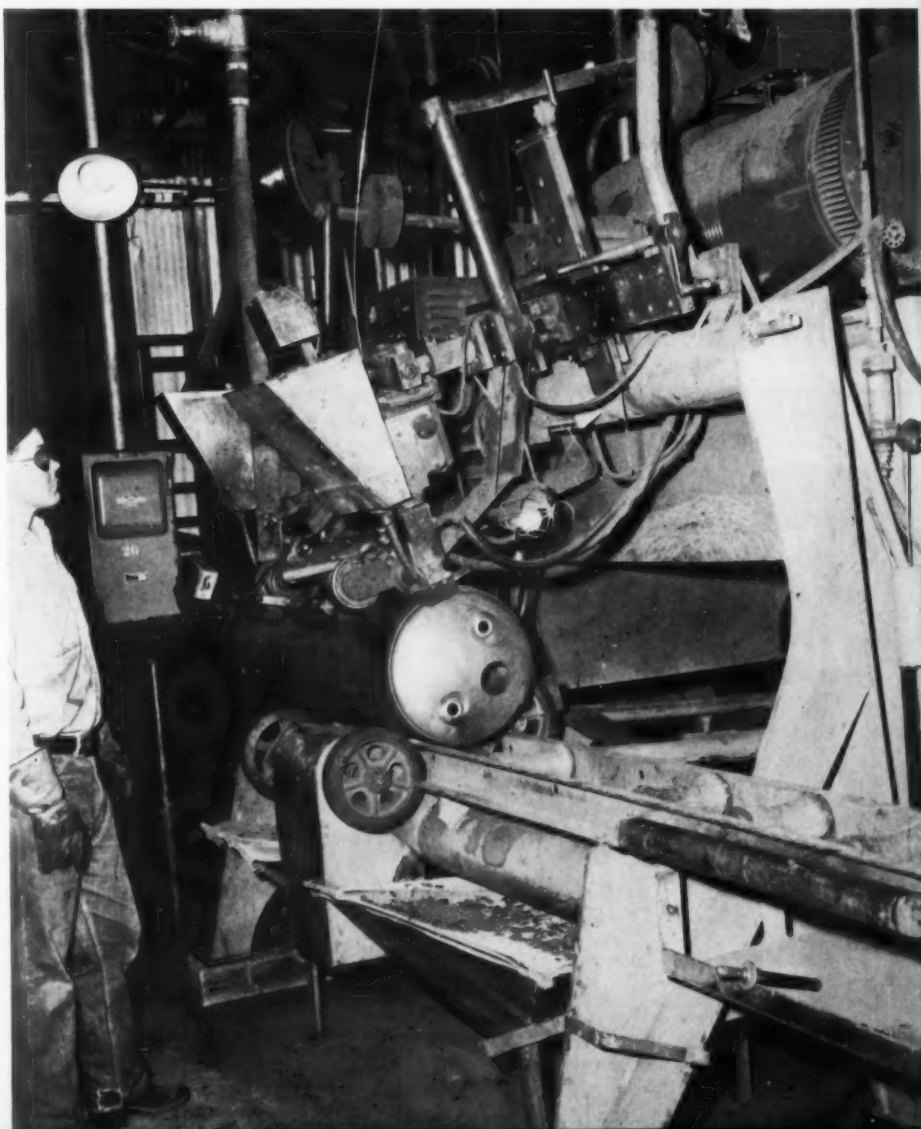
Good illustrations of what the electron can do in a production capacity may be found on the new, high-speed production line installed recently by General Water Heater Corporation, of Burbank, California. This 35-year-old concern has been in the business too long to miss a good bet when it approaches, and in renovating their production set-up, they banked heavily on the electron.

In two installations along this new line, electrons are as obviously at work as they might be in a Century of Progress exhibit. In one of these installations, the taps for all threaded orifices in a water heater body are electronically centered before the tap threads bite into the metal. In another installation, utilizing a reciprocating disc paint atomizer and strong electrostatic field, some 120 water heater jackets are painted in an hour without enough overspray to effectively coat the back of a dime.

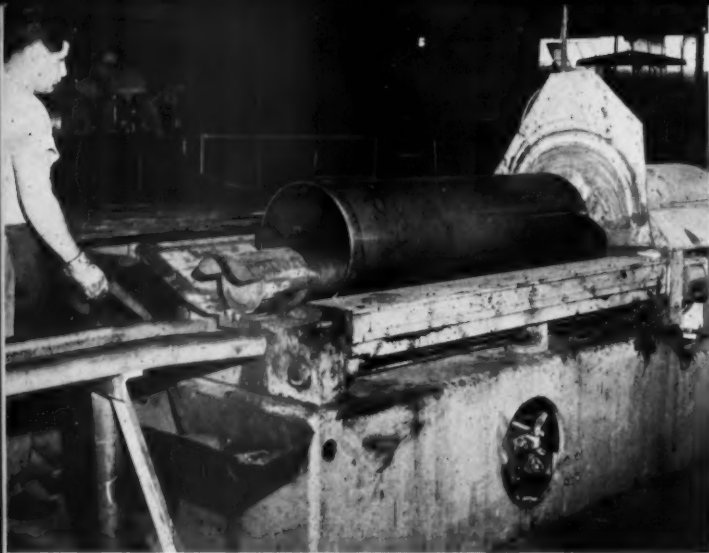
Taken as a whole, the new General Water Heater production line is one of the best integrated, straight-line production facilities this writer has

seen in more than a decade of West Coast industrial coverage for *finish* magazine. Tributary and "feeder" lines which so often complicate a production line set-up are non-existent in the practical sense. Re-routing of work, re-handling, in-process work accumulation, and in-plant transpor-

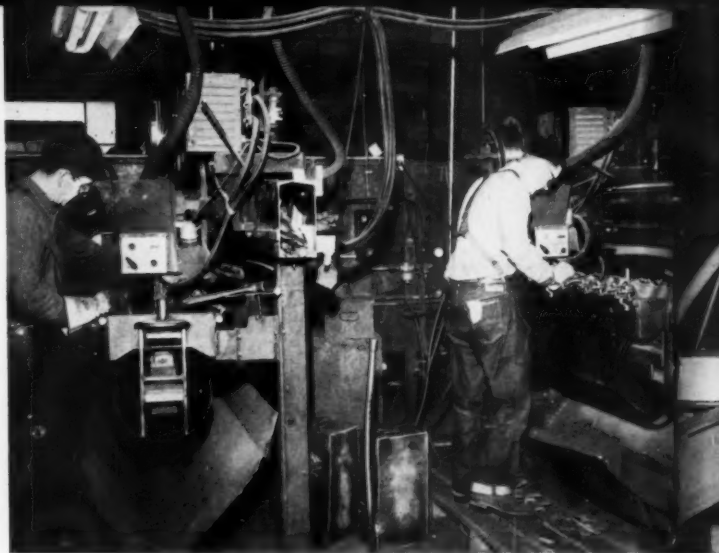
tation has been cut to a minimum. The entire line is infused with an inexorable movement toward completion from the time raw stock is drawn from the storage yard until the water heater is finished, painted, crated, and a part of the permanent 400,000 inventory of water heaters



This machine welds the tank head and bottom in place in a single operation. The production equipment at each work station is carefully balanced to line work requirements.



Use of conveyors between operations enables a single true-circle roll to produce enough tank bodies to keep the new line busy.



Following rolling, the bodies are seam-welded on this pair automatic seam welders using submerged arc welding technique

maintained to cushion market demands.

L. Bruce Grannis, General's executive vice president, points out that concentration on a single type of product aided greatly in setting up the new straight-line production facilities.

H. M. Scarff, vice president and works manager, summarizes development of the new line in this way:

"We started to revamp our facilities about two years ago. We didn't hurry the job. We took time to analyze each production operation, decide upon the best available method to accomplish it, and how it could be integrated with other operations along

the line. If the production machine we needed wasn't available, we designed and built one to meet our specific requirements. When we ran into a problem that seemed insolvable, we burned midnight oil until we found the answer.

Galvanized, glass-lined and copper "bodies"

"Today, with about 200 employees operating on one full and one skeleton 8-hour shift, we are turning out from 500 to 600 water heaters a day ranging from 20 to 100 gallons in size, containing either a galvanized, glass-lined, or copper body, crated and ready for shipment to the customer."

A spur track parallels one side of the huge General Water Heater store-room with its maintained supply of 5000 water heaters. A truck loading dock stretches across one end. "We ship both ways," explained Lon Chaney, production manager, "but maintain our own truck fleet for distribution to our outlying warehouses, and for local delivery."

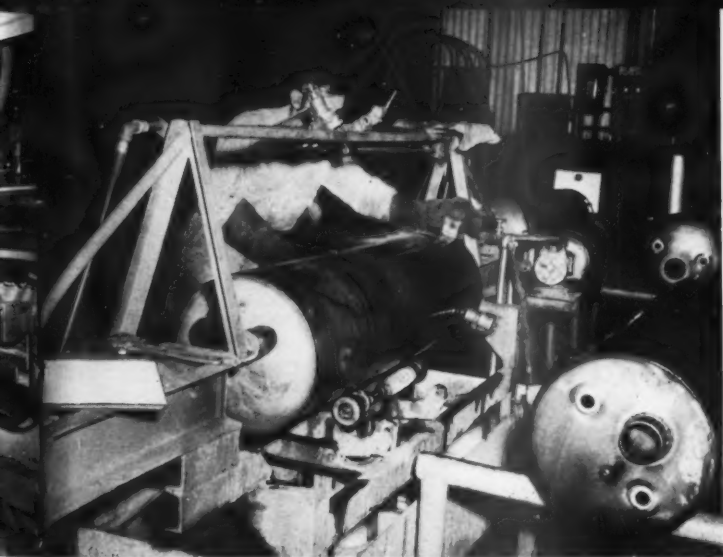
Every part for the water heater, except the thermostats, is made in the company's own shops. This includes even fittings, nipples, burners, boiler tubes, etc. All raw stock is received via truck and stored adjacent to the heavy press department. Precision shears trim the sheets for the bodies

Tank bodies are galvanized, two at a time, in 72,000 lb. zinc tank. Conveyorized cleaning, pickling and fluxing precede this operation.

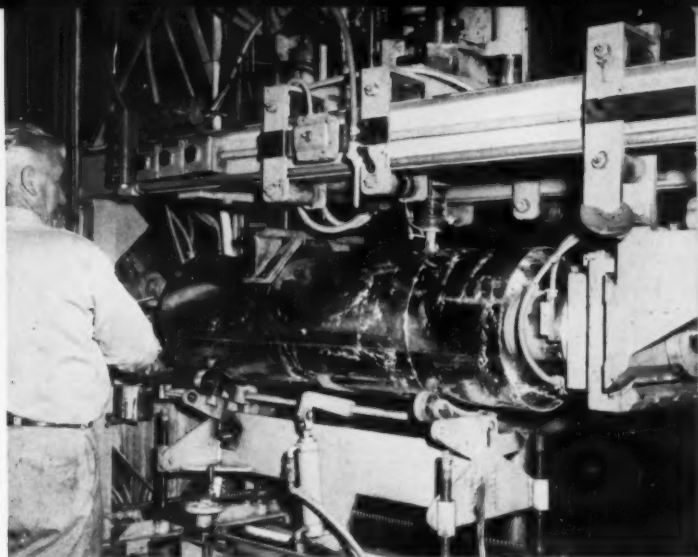


After shearing and piercing, jackets are rolled, box-seamed, then hung on conveyor which carries them through the automatic washer visible in background. Jackets remain conveyorized until they are painted.





pair Air-testing tank bodies at 20 psi immediately after welding. A soap solution with wetting agent is used as the testing medium.



After galvanizing, electronic tapping machine taps all connections on body in single operation. Each tap is automatically centered.

and jackets. A true-circle roll forms the bodies. Heads and bottoms are produced on a 300-ton press.

From the roll, bodies travel by roller conveyor to a pair of company-designed, submerged arc automatic seam welders. The copper bodies are heli-arc welded. Another company-designed machine presses both bottom and head into place in a single operation.

An automatic positioner and hand torch are used to weld the heads and bottoms onto the larger tanks. Heads and bottoms for the mass run of medium-sized tanks are automatically welded in place on a company designed automatic welder. After welding,

all bodies are air-tested at 20 psi using a wetting agent and soap solution to detect any leaks. After this test, the sheet iron bodies are ready for galvanizing.

The bodies are first cleaned in a hot alkali cleaning solution, then pickled for from 30 to 45 minutes in a 10% acid tank. During this operation, they are handled by overhead conveyor. After leaving the pickle tank, the bodies are automatically fluxed, then galvanized, two at a time, in a 72,000 lb. galvanizing tank.

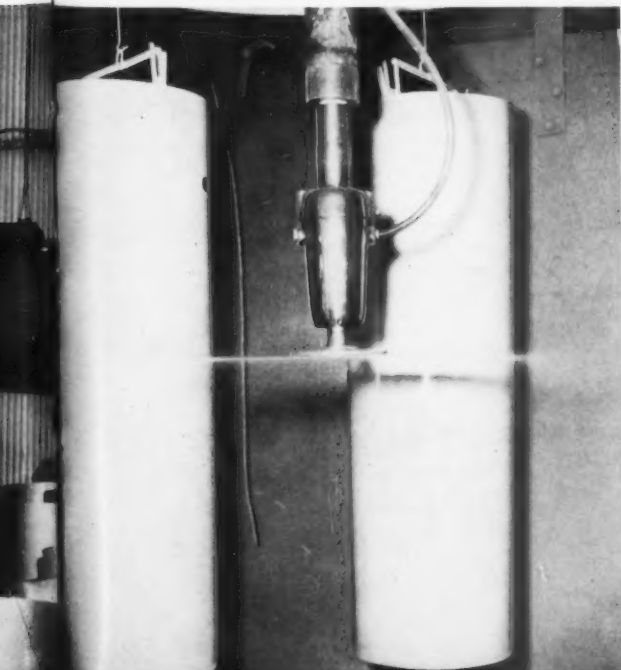
Electronic hole tapping

After galvanizing, the heater bodies go to the electronic hole tapping ma-

chine. The operator of this machine positions the body only approximately, then clamps it rigidly in place. The taps, not the heater body, are the moveable elements in this operation. Each tap is lead by a conical tapering nose which literally "feels out" the exact center of the hole to be tapped, then positions the tap accordingly through a series of microswitch-controlled operations. All taps are centered and all holes tapped at one time. From the operator standpoint, this critical operation has been reduced to a simple loading and unloading task. H. M. Scarff designed this machine, and insofar as is

to Page ST-9 →

n con Reciprocating disc-type atomizer is used to paint the
round jackets. Due to the powerful electrostatic field employed, overspray is practically non-existent.



Roomy pits along the final assembly line provide ample work space. In this pit section, heater tubing is cut and formed as required. Heaters travel down this conveyor on their shipping crate bases.





PAINT MILEAGE JUMPS

from 370 to over 600
square feet per gallon with

RANSBURG NO. 2 PROCESS

● When General Water Heater Corp., in Burbank, Calif., switched from hand spray to Ransburg No. 2 Process in painting water heater jackets, paint mileage increased almost 65%. Where General formerly got 370 square feet per gallon of paint, they now get over 610 per gallon.

On this installation, units ranging from 20 to 100-gallon size are painted with Ransburg No. 2 Process reciprocating disc atomizer. Changes in jacket sizes can be made without stopping the conveyor. With the reciprocating disc atomizer,

change in stroke length is made "on the fly" without shutting down production. General also paints smaller parts, such as heater tops, bottoms, doors and legs, with the Ransburg equipment.

In addition to paint and labor savings, General Water Heater is getting "excellent consistency" and a high quality finish on their products. Another on-the-job-example of the unmatched efficiencies of the Ransburg No. 2 Process of electrostatic spray painting!

Ransburg maintains complete laboratory facilities for test-painting YOUR products under simulated production conditions. Why not let us show you what Ransburg Electrostatic Processes can do for you in YOUR finishing department. No obligation.

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For further information about Electrostatic Painting Processes and complete Ransburg services, write Dept. F

Here's valuable information from Du Pont on FINISHING ROOM AIR-CONDITIONING UNITS

Find out more about...

COVERAGE RATES

BAKING SCHEDULES

METAL
PREPARATION

PRIMING

ENAMELING



APPEARANCE AND PROTECTION

Product appearance is an important consideration in every sale. When the product, like room air-conditioning equipment, becomes part of the home furnishings, attractive appearance is essential.

But, the finish does more than make the product attractive, it protects and prolongs the life of the unit. As the air inside an operating unit is humid, often to the point of saturation, moisture condenses on the inside of the cabinet and the functional parts. For this reason, the framework, supports, and operating parts must be thoroughly protected so rust and corrosion do not destroy the efficiency and finally ruin the machine. As ordinary finishes quickly break down under such continued exposure to damp air and condensed moisture, finishes with exceptional resistance to moisture are required to afford the needed protection.

To these considerations, add the fact that part of the unit must withstand outdoor exposure for years. Most manufacturers wisely insist on a finish which will protect the metal for five years under such exterior exposures, even though homeowners usually paint the section of the cabinet which is outside the house before five years have passed. The longer service of units which have been properly protected with an adequate finish creates the customer goodwill that builds a sustained demand for the product.

The manufacturer must also resolve the many practical problems of finishing. It would seem, for example, that the cabinet, or outside shell, would be a simple thing to finish; but this is not the case. Besides the fact that part of the cabinet must withstand outdoor exposure for years, the very construction of the unit itself creates finishing problems. Sharp edges, welded joints, louvers, corners, etc. make it difficult to apply finishing materials in an unbroken film of adequate thickness over the entire

unit. Yet, such a film is necessary to resist moisture and corrosion.

The many problems likely to be met in applying finishes to room air conditioners are briefly outlined in this bulletin. It is based on the experience gained in helping designers, production engineers, and finishing foremen in the air-conditioning industry solve their finishing problems. We hope this report will help you produce beautiful, marketable units which are thoroughly and completely protected to give years of service.

METAL PREPARATION

a. Cleaning

All parts to be finished must be absolutely clean; free from dirt, oil, rust, corrosion, grease, chemical deposits, and adhering scale. If the metal is in good condition, a vapor degreasing or alkali cleaning operation will usually be adequate before phosphate treating. Once the metal is clean, it is important to avoid handling without the use of clean, cotton gloves.

b. Phosphating

Hot-rolled, cold-rolled, and zinc-coated steel are used by different manufacturers for the cabinets and parts of their units. To provide maximum protection with each of these metals, a phosphate treatment before finishing is essential.

PRIMING

The exceptionally high humidity in operating room air conditioning units makes it most important that the primer be able to withstand almost continuous exposure to moisture.

Because rust will attack any spots of exposed metal and gradually extend out under otherwise protected areas, a solid, unbroken primer coat is essential. It is necessary, too, that the primer film be thick enough to provide adequate protection against moisture for long periods of time.



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The outlook in the gas appliance field

utilities expect to add 1,200,000 new home heating customers in each of next 3 years

by *Edward R. Martin* • DIRECTOR OF MARKETING AND STATISTICS, GAS APPLIANCE MANUFACTURERS ASSOCIATION, NEW YORK CITY

THE following are some of the factors contributing to favorable outlook for the gas industry.

At the end of 1954, the gas industry served a total of 33,156,200 residential customers. Of this total, 25,806,200 were served by gas utilities and 7,350,000 served by the LP-Gas Industry. The growth of the residential phase of the gas industry is evidenced in the accompanying table:

Residential Customers					
	1954	1953	1941	% change 1954 over 1953	% change 1954 over 1941
Utility Gas	25,806,200	25,120,000	17,501,000	+2.7	+47.5
LP Gas	7,350,000	7,000,000	1,645,000	+5.0	+346.8
TOTAL	33,156,200	32,120,000	19,146,000	+3.2	+73.2

Today, a network of some 463,000 miles of transmission, distribution and gathering pipelines are required to bring gas service to the homes and industries of the nation. In 1954 alone, 17,500 miles of new pipelines were added to the gas industry's continually growing systems.

This rate of expansion is backed by an increasing proved and recoverable supply of natural gas. The rate of discovery continues to exceed the rate of production. At the start of 1954, natural gas reserves amounted to 211.4 trillion cubic feet, a net increase of 11.7 trillion cubic feet over the previous year. This increase was established despite the record production of 9.2 trillion cubic feet during 1953.

Since December of 1945 through July 1 of 1954, and including those projects pending authorization by the Federal Power Commission on January 1, 1954, natural gas transmission construction expenditures exceeded 4½ billion dollars.

Gas utility and pipeline construction expenditures are estimated at more than \$1,100,000,000 during the coming year.

The gas utility industry expects to add about 1,200,000 new houses heating customers in each of the next three years. In order to meet this, and other expanding markets, the gas industry spent some \$50,000,000 in 1954 to develop underground storage

fields. It is expected that a similar amount will be spent for the same purpose during 1955.

The industry, while confident of continued progress during the coming year, will not rest on its laurels and content itself with the normal gains of expanding markets. The industry, in all its phases, is competitive. It is fully aware that progress must be measured against its own adequacy and willingness to do competitive battle.

The gas industry has always been well fortified with industry-wide sales promotion and advertising programs. The year ahead will be no exception.

Position of gas appliance and equipment manufacturers

Generally speaking, gas appliance and equipment manufacturers anticipate comparative 1955 volumes which are in tune with the forecasts for industry as a whole. For example, the consensus is that 1955 volume will exceed 1954 volumes.

Estimated Volume 1955/1954

Domestic gas ranges	+5.6%
Automatic gas water heaters	+1.9%
Gas-fired warm air furnaces	+8.0%
Gas-fired boilers	+4.3%
Gas-fired conversion burners	+2.6%

These percentages could be materially increased if all individual manufacturers perform up to expectations.

Other gas appliances, such as clothes dryers, incinerators, hotel and restaurant cooking equipment and gas-fired unit heaters look for even more substantial increases in sales volumes.

Manufacturers of gas-fired vented recessed wall heaters, and direct heating equipment expect approximately the same sales volumes in 1955 as in 1954. Gas-fired floor furnace manufacturers anticipate their industry volumes to fall below last year.

There are many significant indications. Domestic gas ranges, since accomplishing a peak sales year in 1950, have found sales falling into a declining pattern. The consensus is that this trend will be reversed during the coming year.

Automatic gas water heater sales are expected to come close to the previous annual sales record set in 1950.

In the gas-fired central heating field, gas-fired warm air furnace sales established a new peak in 1954 and anticipate going on to higher planes in 1955.

Conclusion

The increased sales of gas appliances and equipment manufacturers

to Page 132 →

The outlook for electrical appliances

electrical industry has second best year in history—look to new high level in 1955

by *W. J. Donald* • MANAGING DIRECTOR, AND *A. J. Nesti* • CHIEF STATISTICIAN,
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION, NEW YORK CITY

LAST year's predictions for excellent business conditions in the electrical manufacturing industry (see February, 1954, finish p. 34) in 1954 have been realized. The industry shipments amounted to \$15.6 billion, which was only 5% below the 1953 peak volume of \$16.4 billion, and which represented the second best year in volume of shipments in the entire history of the industry.

Looking ahead to 1955, the industry expects to increase its shipments by 5% over 1954, which would bring sales back to the all-time high level of 1953 with a possibility that a new high level will be established. These expectations are based principally upon the increases expected in residential, commercial, and public and institutional construction, and also upon a continued high level of consumer earnings and consumer expenditures.

As was expected, most of the branches of the electrical manufacturing industry fell off in sales volume in 1954 from the very high levels of 1953. Electric appliances, industrial apparatus, and electrical insulating materials were all off 10%; while electrical building equipment and supplies dropped 8%; and insulated wire and cable dropped 5%. On the other hand, illuminating equipment showed a slight increase of 1%; generating, transmission and distribution equipment showed an increase of 3%; and signalling and communication equipment showed a sizeable increase of 10% over 1953.

The performance of the Electrical Manufacturing Industry paralleled the performance of business in general which, in 1954, saw industrial production, according to the Federal

Reserve Board Index, decrease about nine points, or 7%, from the 1953 average.

Looking ahead to the coming year, the down-trends of 1954 are expected to be reversed for all branches of the electrical manufacturing industry with the exception of generating, transmission and distribution equipment, which is expected to fall off 5%.

The appliances picture

Electric appliances in 1955 are expected to recuperate much of the loss suffered in 1954. An increase of

Estimated Sales 1955 Electrical Appliances

3,500,000	Refrigerators
1,000,000	Freezers
1,250,000	Ranges
800,000	Water Heaters
1,000,000	Room Air Conditioners
2,500,000	Automatic Washers

approximately 6% overall is expected in 1955. In particular, such new appliances — comparatively speaking — as dishwashers, food waste disposers, automatic clothes washers, clothes dryers, dehumidifiers, and custom-built ranges, are expected to show sharp increases.

The basis for the expectations in shipments of electric appliances (see box listing) lies in the fact that a 13% increase is expected in the construction of new dwelling units, and a continued increase is expected in new family formations. In addition, with consumer incomes at continued high levels, a high replacement market is expected with new and up-to-date appliances taking the place of outdated units.

Although electric appliances as a

group experienced a downward turn of 10% during the year 1954, the sales of a number of individual appliances were markedly higher than the previous year.

The greatest gains were shown by sales of Electric Fans (25%), Dishwashers (25%), and Room Air Conditioners (18%). Substantial increases were also shown for Electric Clothes Dryers (15%), and Food Waste Disposers (10%). Washing Machines and Commercial Cooking Equipment increased about 5%. In general, the newer appliances on the market appeared to have made the most gains during 1954, with the exception of sales of Farm and Home Freezers, which decreased 25%. The older products suffered decreases ranging from 5% to 44%. Ironing machines suffered the most drastic reduction of 44% and were followed by sales of Electric Housewares (-15%), Refrigerators (-10%), Electric Ranges (-5%), and Vacuum Cleaners (-5%).

Appliance forecast for 1955

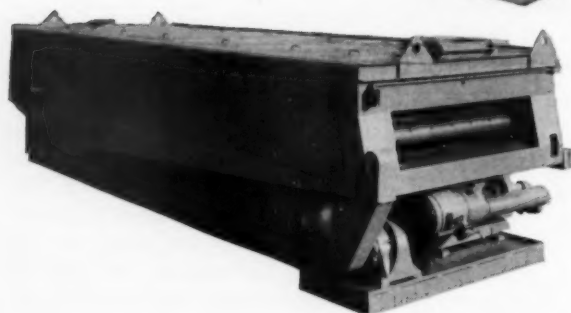
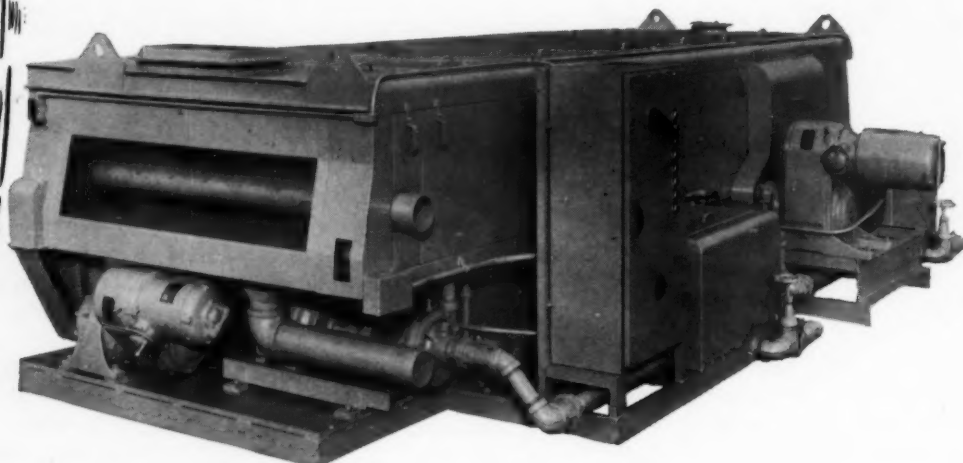
It is expected that for the coming year of 1955 most of this loss will be regained, with an overall increase of approximately 6%.

The estimated total shipments of the major appliances will increase in 1955 anywhere from 5% to 20% with Food Waste Disposers and Dishwashers expected to show a 20% increase, while Commercial Cooking Equipment and Farm and Home Freezers show a 10% increase, and Dehumidifiers, Electric Housewares, Electric Ranges, Electric Household Refrigerators and Electric Water Heaters show a gain of 5%.

to Page 132 →



Compact Design "kills" Space-Wasting Bulk



Power Spray Sheet Washers Compactly Designed By P-D To Speedily Wash Sheet Steel After Polishing





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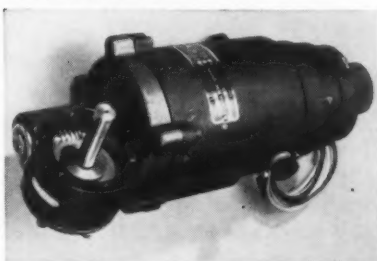
DOW CORNING
CORPORATION

Silicone News

FOR DESIGN ENGINEERS

Silicone Grease Saves Money; Increases Life of Alloy-to-Plastic Gears in Precision Gearmotor

Using the best organic lubricants, maximum life of the gear set in a test model of a new precision gearmotor designed by Lee Engineering Company of Milwaukee, was only 100 hours. Temperature at point of contact between the nickel alloy worm and phenolic gears was so high that organic lubricants were rapidly separated and thrown out, even though the gearbox was fully packed.

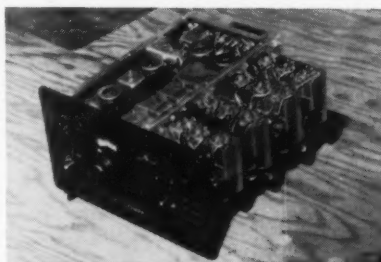


Before major alterations in design were undertaken, Lee engineers tried Dow Corning 33 Grease, light consistency. A first trial run of 1200 hours showed no appreciable gear wear. Further tests proved that a basically sound design had been made practical by a stable lubricant.

With only enough Dow Corning 33 to fill the teeth required to give long service, Lee engineers found that even the initial cost of the silicone grease was less than that of a gear box-full of the organic grease previously tried.

Now in commercial production, these silicone lubricated precision gearmotors are put to many uses. For example, the $\frac{3}{4}$ hp unit shown here with a 40 to 1 gear ratio and a speed range of 10 to 200 rpm on the phenolic gear, is used to feed wire in an automatic welding machine. No. 24

New 1955 Reference Guide to Dow Corning silicone products gives in 8 pages a brief but comprehensive summary of the properties and applications for the silicone products that are most widely used. Products are indexed by type of application. With increasing effort devoted to product improvement and cost reduction, such a reference guide to this remarkably stable group of engineering materials becomes increasingly important to design engineers. No. 25



RF Transformers Impregnated with Silicone Fluid Exceed Humidity Specs

The RF transformers in radio compasses made by LearCal Division of Lear, Incorporated, passed Ordnance tests for moisture resistance and extreme thermal shock. Lear felt, however, that for permanent protection, the transformers should be potted to come as close to forming a true hermetic seal as possible.

After potting with mica-filled epoxy resins, the transformers are, therefore, vacuum impregnated with Dow Corning 200 Fluid. Silicone treated transformers easily pass the humidity tests of SC-D-1594 and MIL-E-5400. They may be immersed in water for 30 minutes with no change in electrical properties. No. 26

Westinghouse Seals New Switches With Silastic for Sub-zero Service

Sealed, top and bottom, with Silastic gaskets, the new Westinghouse gas-filled, load interrupter switches remain operable at temperatures as low as -65 F. Organic rubber seals were originally tried, but sub-zero weather caused the seals to harden and shrink, allowing the sulfur hexafluoride gas to escape.



On testing, Westinghouse engineers found that Silastic gaskets easily passed all pressure, vacuum, and temperature requirements, and were not affected by the gas. The Silastic gaskets provide such a tight seal that Westinghouse expects the units to hold gas pressures of 30 psi indefinitely without recharging. No. 27

Silicone Aluminum Paint Protects Jet Engine Combustion Chambers

The materials used in many of the combustion chambers and burner supports manufactured for J-35 jet engines by Solar Aircraft of Des Moines, must remain unaffected by abnormally high temperatures. Aluminum clad steel solves the problem satisfactorily with exception of various fusion welds. These must be re-coated with aluminum or a noncorrosive coating that will withstand up to 800 F.

Solar engineers have the answer to that problem, too. They simply spray or dip the welded part with two coats of Sicon, an aluminum paint formulated with Dow Corning silicone resins by Midland Industrial Finishes.



After a one hour bake at 400 F, the silicone based coating provides the required protection. According to Solar, this is one of the most satisfactory paints for use on jet engine parts. No. 28

Design Edition 6

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Home laundry industry looks to increased sales

industry sales for 1954 at the billion dollar mark

INCREASED sales of home laundry appliances during 1955 are predicted by most members of the American Home Laundry Manufacturers' Association, W. Homer Reeve, AHLMA president, reported at the association's annual meeting, January 7, at the Morrison Hotel, in Chicago.

Final figures on 1954 factory sales of household washers, dryers and ironers will show that the industry will top the 1953 mark of 4,311,330 units, which in turn was 8 per cent ahead of 3,991,408 units in 1952, stated Reeve.

\$30,000,000 expansion

The survey of the home laundry manufacturers also indicated that practically all companies were planning plant and equipment improvements during this year. Reeve stated that AHLMA members' investment in plant expansion and improvements in 1954-55 will come close to \$30,000,000.

Reeve, who is also president of

Easy Washing Machine Corp., was reelected to head AHLMA during 1955. All other officers were reelected.

Directors elected in accordance with a new arrangement whereby the automatic and conventional washer representation are merged and two directors-at-large are added, will include the following:

Washer division: J. J. Anderson, manager, home laundry equipment division, Westinghouse Electric Corp., Mansfield, Ohio; V. F. Peterson, manager, automatic washer department, Norge Division, Borg-Warner Corp., Chicago.

Dryer division: R. G. Halvorsen, vice president, Hamilton Manufacturing Co., Two Rivers, Wis.; E. J. Sorensen, home laundry division, Hotpoint Company, Chicago.

Ironer division: Joseph Groshans, general sales manager, ironer division, Speed Queen Corp., Algonquin, Ill.; B. J. Hank, president, Conlon-Moore Corp., Chicago.

Directors-at-large: George P. Castner, general manager, Beam Manufacturing Co., Webster City, Iowa; Roy A. Bradt, vice president, The Maytag Company, Newton, Iowa.

A billion dollar industry

Manufacturing home laundry equipment has undergone "a dramatic transition within a few years from being a relatively small, closely-knit personal operation, in which a few men who knew each other well met and worked out their problems among themselves, to the status of a billion dollar industry," asserted Guenther Baumgart, AHLMA's new executive director.

"Consider that the annual rate of home laundry appliance sales is approaching the 5,000,000 unit mark. Today's figure, of course, is much further along the line toward complete nationwide household laundry automation than was the sales volume of less than a decade ago, in the eight postwar years, as a matter of fact.

"The sales figure, furthermore, has grown from about \$100,000,000, consumer prices, in 1940, to an estimated \$1,000,000,000 in the year just closed."

As further evidence of the strides taken by the home laundry equipment industry in relatively few years, Baumgart pointed out that the association, which numbers 28 manufacturers producing virtually all the home laundry appliances sold in the United States and an associate membership of about 60 suppliers to the



On behalf of the membership of AHLMA, W. Homer Reeve (right), president, presents an honorary membership to P. Eduard Geldhof, who recently retired as Whirlpool's vice president of engineering.

finishfoto



industry, has 18 major committees and between 400 and 500 executives active in its organization affairs.

AHLMA statistical service

The statistical service of AHLMA is being used to forecast appliance movement at the factory, distributor and retail levels and for measuring company competitive position at the factory and distributor points and in individual trade areas, stated George W. Westfall, chairman of AHLMA's market research committee.

Production and sales data compiled by the association also are used in determining compensation, setting budgets, fixing distribution areas, measuring sales volume by type of outlet and by town size and measuring volume by model classification according to price groupings, according to Westfall, who is manager of distribution planning for Hotpoint Company, Chicago.

The practicability of reporting distributor sales to dealers on a county basis more frequently than once a year is being studied by a sub-committee of the market research group, reported Westfall.

Plan new method of evaluating field performance

New methods for evaluating the field performance of home laundering appliances and development of a basic training course in the fundamentals of automatic washer servicing are in the works for 1955 planning for the AHLMA parts and service committee, reported J. H. Miller, chairman, who is also man-

ager of product service department, General Electric Co., Louisville, Ky.

Under the proposed field test procedure, each member would be invited to make a confidential semi-annual report, expressed on a standard basis, of the field performance of his products. After summarization of the data, the high, low and average performance ratings for the industry-at-large would be reported back to each participating manufacturer for comparison by him with the ratings of his own washers, dryers and ironers.

Miller reported that the training course would be designed for use by distributors, dealers and vocational schools. "There is considerable justification for the belief that there is an acute shortage of active and potential servicemen with knowledge of the servicing of automatic washers," said Miller. "Consequently, this proposal offers the possibility of filling a great need in our industry."

Propose new UL standards

Proposed new Underwriters' Laboratories standards for household washers, a supplement to the U.L. standards to cover the specific subject of clothes dryers, and study by a special sub-committee of revision of the industry test procedure for evaluating household washer performance, were announced by E. O. Morton, head of AHLMA's engineering and research committee.

"With the extraordinary public acceptance of today's home laundry equipment, U.L. nevertheless has

been able, in little more than a year, and despite its being swamped with consequent testing work, to submit a proposed new standard for washers and a proposed supplement for dryers, as well as a revised standard for ironers," said Morton, who is manager of laundry equipment engineering, Westinghouse Electric Corp., Mansfield, Ohio.

Traffic committee report

Traffic managers of home laundry firms are in a constant campaign to keep transportation charges at the lowest possible figure for the benefit of producers, distributors, dealers and consumers alike, stated R. F. Carr, AHLMA traffic committee chairman, and traffic manager of Frigidaire Division, General Motors Corp., Dayton, Ohio.

The association's traffic committee, said Carr, has been able in many

to Page 138 →

1955 AHLMA Officers

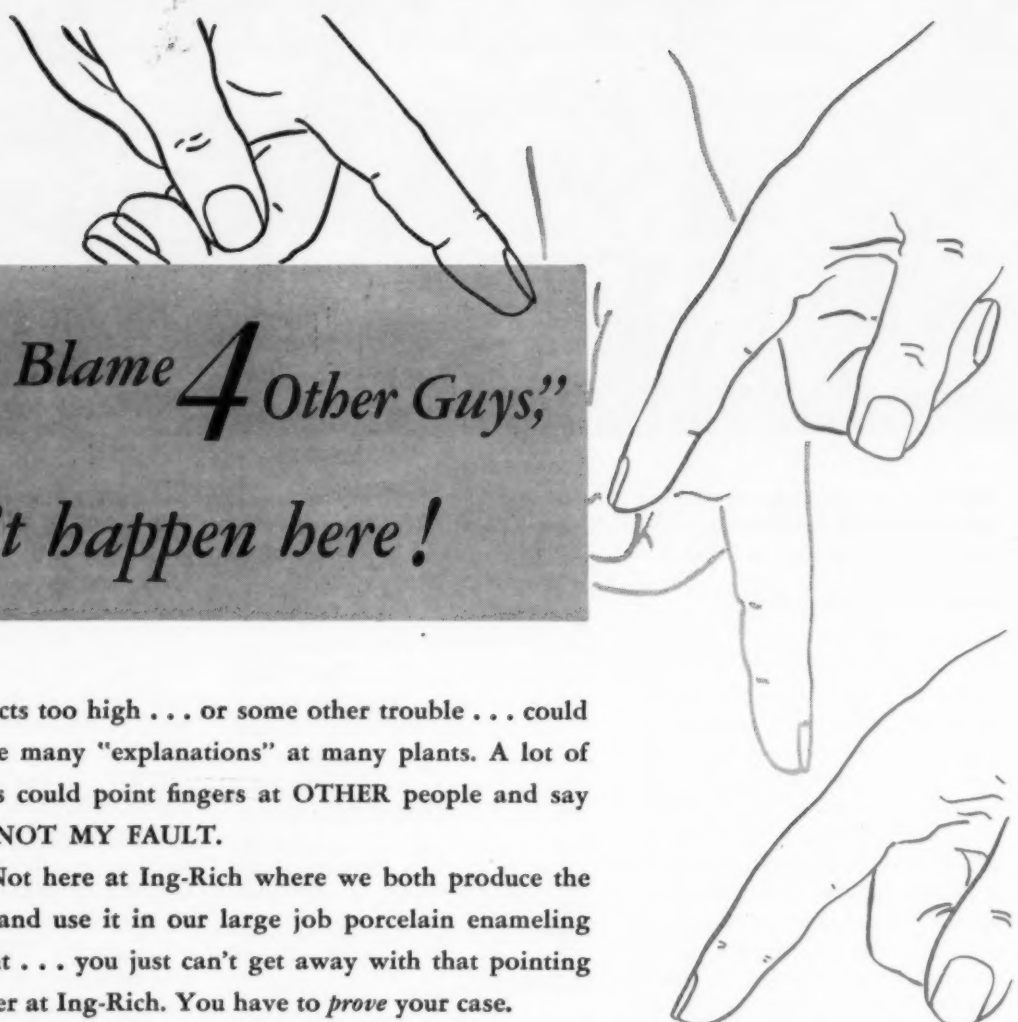
President: W. Homer Reeve, president, Easy Washing Machine Corp., Syracuse, New York.

1st Vice Pres.: Elisha Gray II, president, Whirlpool Corporation, St. Joseph, Michigan.

2nd Vice Pres.: Frank Breckenridge, president, Automatic Washer Co., Newton, Iowa.

3rd Vice Pres.: James H. Goss, general manager, home laundry equipment, General Electric Co., Louisville, Kentucky.

Treasurer: Howell G. Evans, senior vice president, Hamilton Manufacturing Co., Two Rivers, Wisconsin.



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THE finish LINE

HOME appliances in "consumer-preference" colors and with sparkling new designs were displayed in abundance at the 1955 winter market held in Chicago, January 3-14. Only a few of the larger manufacturers seem to have delayed their entry into the color field.

Practically all range producers showed sectional cooking equipment with built-in, drop-in, and/or drop-on type ovens and surface units.

Other new developments noted included General Electric's introduction of a washer-dryer combination, Caloric's entry into the automatic washer field, and Globe American's re-entry into the cooking appliance retail field — with built-in and drop-on oven and surface units. Globe also



finishfoto

Appliances for '55 sparkle with new designs and color

displayed a new appliance-styled water softener.

Avco executive sees appliance industry sales up 3 to 30%

At the annual appliance press conference at The Merchandise Mart, Parker H. Ericksen, executive vice president of Crosley and Bendix divisions of Avco Mfg. Corp., predicted that "overall, sales of most major appliances should be up from 3 to 30% in 1955 over 1954, with room air conditioners and clothes dryers leading the way."

Ericksen stated that preliminary industry estimates indicate an increase of about 1,000,000 in total unit sales over the 11,430,000 "nine major appliances" sold in 1954. (The nine appliances mentioned by Ericksen are refrigerators, freezers, ranges, water heaters, automatic washers, disposers, dryers, air conditioners and dishwashers.)

finish FEBRUARY • 1955

U. S. Steel planning operations "Wifesaver" and "Raindrop"

R. C. Myers, director of the market development and product development divisions of U. S. Steel Corp., reported on his company's recent "Operation Snowflake" which was launched last fall to promote appliances as Christmas gifts.

"It is difficult to evaluate, in units sold, a new promotional venture such as Operation Snowflake," stated Myers, who added that "early reports indicate that in some areas of the country little change was noted in appliance sales. In other sections, where the fire caught on and there was enthusiastic local support, such as in Los Angeles, dealers reported sales up from 5% to 30%, and have said that the national campaign helped tremendously."

Gratified with the net results, Myers reported that U. S. Steel is

planning two similar campaigns — "Operation Wifesaver" in April and May, and "Operation Raindrop" in June.

finish MARKET SURVEY

Hotpoint — "Sales in the last half of '54 ran 55% above the last half of '53, and for the entire year were up 10%. We expect the industry to run from 5 to 10% ahead of last year in '55. Hotpoint expects sales to go up 15%. Our ranges, and particularly our custom line, are hot items." — **John M. McDaniel**, vice president, marketing.

Caloric — "Sales of Caloric appliances during '54 ran ahead of '53 sales. For '55 we have increased our production facilities by 20%. We have a complete new line of gas ranges — not an interchangeable part



Hotpoint displayed "Tomorrow's Kitchen—Today" as the opening feature of the company's golden anniversary celebration during 1955.

with last year's models — and all electrical connections are accessible through front. Lighting for the glass backguard panel is available in four colors — frosty blue, minty green, rosy pink and cool white.

"For our built-in range line, the oven door panel and broiler door panels come in yellow, pastel blue, green and black & white. Both surface units and fronts are plated (copper, nickel and chrome), either polished or satin." — **Nathan R. Klein**, chairman, and **Julius Klein**, president.

Roper — "In 1954 we ran about even with 1953, dollar-wise. For this year we are expecting to be about 15-20% above last year. Our built-in line is expected to go very well this year. Currently we are offering ranges in two colors — green and yellow." — **E. Carl Sorby**, vice president.

General Electric — "The industry in general will be up about 5% this year, and major appliance business for G-E will be up 8-10% over 1954, which was up 3% over 1953.

"Our entry into the color field this year (with 6 mix-or-match colors for our major appliances) was prompted by results of a recent G-E survey which showed that the desire for color in appliances has gone up in the past four years from 5% to over 50%.

"To our line this year we have added several new products, including a washer-dryer combination, custom-built ranges, and a wall-type refrigerator-freezer." — **J. F. McBride**, mgr., range & water heater dept.

American Motors — "After three weeks of showing and discussing color with dealers, it is our estimate that we will sell double the amount of



Thor's automatic washers feature tops in two colors—sea foam green or desert sand.

colored appliances that we forecast six weeks ago. Reaction of women who have seen our color line is that we have chosen the right colors." — **D. A. Packard**, general sales manager, **Kelvinator** division.

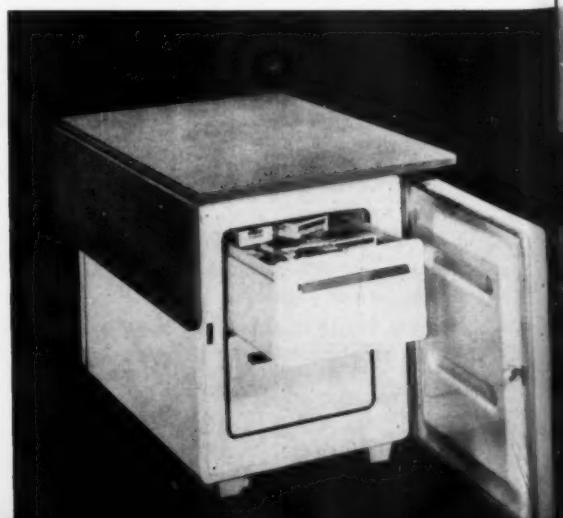
"Our sales in '54 were well ahead of '53, with every month since June showing a sharp increase. Every product in our line is expected to have sales increases this year. We completely retooled for our new lines starting in August." — **Walter Jeffrey**, manager of sales and product planning, **Kelvinator** division.

Westinghouse — "Estimated sales for our entire appliance line ran about 3-5% ahead of '53 during '54. We expect our appliance sales to increase about 10% this year over last. The reaction of our dealers has been particularly good toward our range

Frigidaire's built-in cooking equipment features a surface cooking section which folds into back panel, and wall oven with twin doors.



Revco's "dinette freezer" consists of a 5.5 cu. ft. freezer with a 42" x 42" table mounted on it.





Caloric's gas ranges feature a newly-styled backguard lighted in a variety of decorator colors.

line, particularly for large ovens and our large built-in-oven. We are not offering color on appliance exteriors, but will go to it when the demand calls for it." — **J. H. Ashbaugh**, vice president.

Automatic Washer — "Our washer sales in 1954 were up 260% over sales in the previous year. For 1955 we expect sales to be over last year by an appreciable per cent. We have had wonderful interest at the market, along with good buying." — **D. A. Rizer**, vice president - sales.

Tennessee Stove — "We have had much favorable comment on our new Dial-a-temp Modern Maid ranges which permits the housewife to turn a dial on the back panel of the range for finding the proper cooking time of various kinds of foods. Regard-

ing color, we just introduced a range with color only on the cooking top, and this has brought more favorable comment than our full-color models received". — **L. H. Caldwell, Jr.**

Globe American — "Our new Rain-O-Matic water softener, styled to correspond with today's modern home appliances, seems to have caught the attention of market visitors. Besides its attractive design, it automatically regenerates itself.

"Distributors have also expressed a keen interest in our newly-introduced flexible line of built-in ovens and surface units and set-on cabinet ovens and surface units — for both new and remodeled kitchens." — **J. R. Comer**, vice president.

Detroit-Michigan — "Our overall sales and production were about the same in '54 as '53. For '55, however,

we are out after a minimum 20% increase.

"Our color sales in '54 were beyond expectations, and we expect color sales to continue up. We will feature ranges in island green and Sahara gold — same as last year." — **Paul Inskeep**, director of sales.

Florence Stove — "We are anticipating a nice increase in sales in '55. Our top gas range features a thermostatically controlled top burner which we believe is the greatest improvement in gas stoves since the advent of the thermostatic oven control back in 1913.

"More and more attention is going to color in appliances. In addition to white, we are showing ranges in three colors. Our newest color, copper porcelain enamel, has had much favorable comment." — **Robert H. Taylor**, president.

to Page 13 →



Kelvinator's new "Foodarama" combines an upright freezer and a moist-cold refrigerator side by side in a single cabinet.

General Electric's kitchen center combines a washer-dryer, disposal-equipped sink, dishwasher, and an electric range in one compact unit.



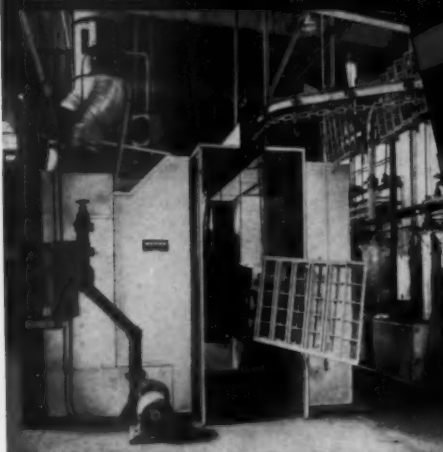
Roper's 40-inch range features a new "Insta-Lite" automatic ignition for top burners, oven and broiler.



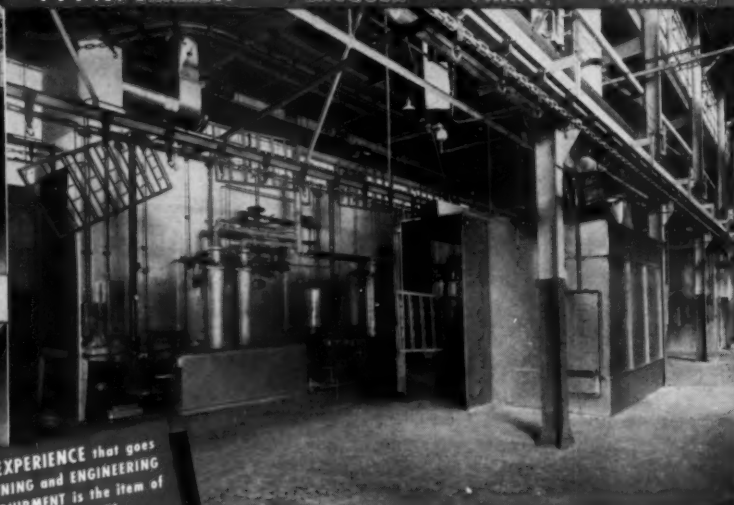
COMPLETE

Finishing SYSTEMS

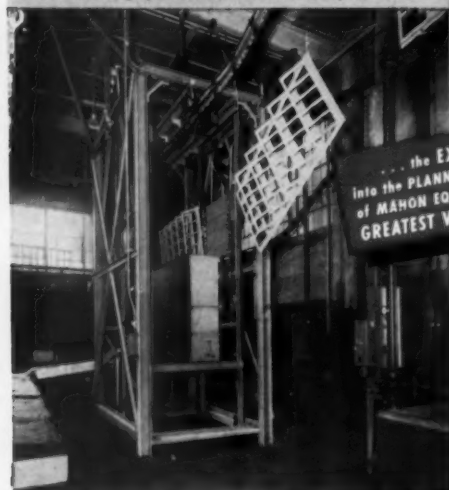
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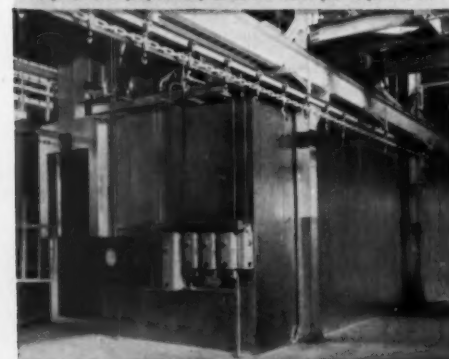
Mahon Hydro-Filter Spray Booth—part of the Complete Mahon Finishing System installed for Color-Craft, Inc.



General view of the Complete Mahon Finishing System at Color-Craft, Inc. Facilities include Six-Stage Metal Cleaning and Rust Proofing Equipment.



Mahon Automatic Dip-Coating Machine at Color-Craft, Inc. Dip tanks employed vary in size to meet job requirements.



Mahon Finish Baking Oven—part of the Complete Mahon Finishing System installed for Color-Craft, Inc., Detroit, Mich.

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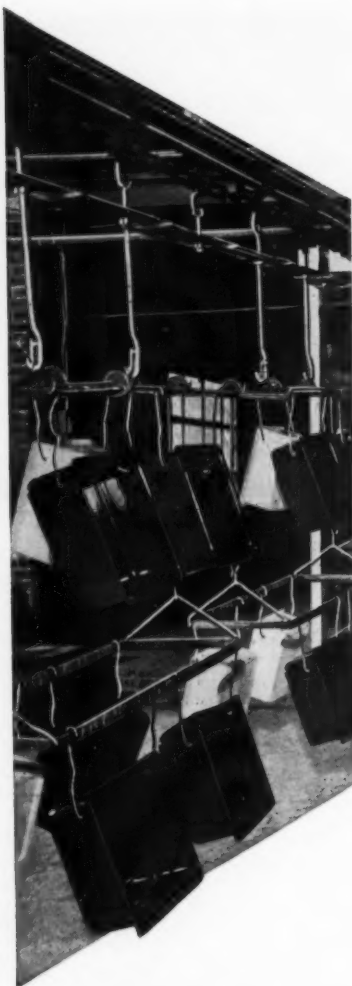
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... for long life at high temperatures

Guide posts in the production of enameled hot water tanks

including design, fabrication, metal preparation and porcelain enameling

by *Don R. Goetchius* • FERRO CORPORATION, CLEVELAND, OHIO

APPROXIMATELY 3 million units of gas and electric water heaters are produced yearly. Barring unforeseen difficulties, it appears that greater percentages of porcelain enamel or "glass lined" heaters will be produced for this market in the ensuing years. With the exception of specialized usages similar to enameled chemical ware, enameled coatings have seldom been called upon to fulfill a more rigorous requirement. Constant exposure to heater water of all types — day in and day out — year in and year out — requires the utmost in enamel formulation, coupled with service data compiled under field conditions.

Influencing factors such as design, steel, steel preparation, enameling procedures and related processes such as welding and assembly, all assume a position of importance when related to the service life of the enameled heater. It is the object of this article to lend assistance to a growing industry.

Design factors

With the exception of material and labor cost, the two main factors influencing design are cathodic protection and the preference of the heating engineers. These usually are the basis on which it is determined that the gas or oil-fired heater will be either of external or internal flue design. In the case of electrically-heated tanks, the same factors are used to determine whether immersion or contact type heating elements are used.

Following the main decision as to how heat is to be applied to the water, pressure requirements dictate the de-

sign and gauge metal used in the head and base construction. Enameling requirements determine the design of the attachments for piping and fabrication prior to the enameling operation.

The function of the magnesium anode to protect glass lined water heaters is fully described in a paper* which was presented at the 1951 Conference and Exhibition of the National Association of Corrosion Engineers. The authors are W. A. Derringer and F. W. Nelson, of A. O. Smith Corporation. The insulating properties of porcelain enamel, which functioned to disadvantage when cathodic protection was not present by concentrating electrolytic action at exposed metallic areas, becomes of great advantage when combined with cathodic protection by concentrating action in those same areas and greatly extending the life of the anode. The magnesium anode is of great importance in determining the service life of the heater, as well as the initial cost of the unit. Cost reduction is achieved by eliminating the necessity for multiple coats, and elaborate electrical inspection procedures. Enameling grade steel no longer becomes necessary. The utmost consideration should be given to this fact before making and marketing a glass-lined water heater in which cathodic protection is not used.

The anode has been shown to be effective in shielded areas, as on the other side of the internal flue, but

*"A Field Investigation of Cathodic Protection in Glass Lined and Galvanized Water Heaters."

undue emphasis should not be placed upon this property, as it will vary greatly with water conditions and experience has shown that it is not effective in water connections just outside the tank body proper, nor in certain areas shielded by the flue at the base of the heater. Enamel inspection in such areas should be more rigid than in unshielded areas. Welds should be located so as to be in close proximity to the anode.

The majority of enameled water heaters produced at the present time consist of a cylindrical shell of approximately 12 gauge metal into which a convex or plus head of six to eight gauge metal is welded prior to enameling. If a concave or minus head is used this is usually enameled separately and welded after the enameling operation. The base is concave, since it is thrust into the cylinder following the enameling operation and may or may not have a flue welded in place prior to enameling. In some instances, the flue is enameled separately, making a three-piece unit, but this requires an additional welding operation since the flue is welded both at top and bottom after enameling; therefore, it is usually not recommended. While the internal flue is undoubtedly a factor in strengthening the vessel, consideration of its shielding effect on the anode will determine whether or not it is incorporated in the design. While it is undoubtedly simpler to enamel a water heater without an internal flue, no great difficulties have been experienced in the past and it is felt that field experience will dic-

tate future design. At the present time, the enameling of a closed vessel would appear contrary to the expressed opinion of obtaining a desirable market by production of quality merchandise.

Water, control and drain cock connections are made by welding fittings onto the head or shell metal. These have been troublesome in the past since they constitute an area in which enamel applied by draining may hang up and underfire, causing weak enamel structures prone to chippage. This condition is exaggerated by using extremely heavy fittings or permitting the concentration of large quantities of weld metal in these areas. Where sufficient base metal is present, as on heads, or bases, extrusions may be made for the fittings. Care should be taken to make allowance for enamel thickness in those areas which must be fitted together following the enameling operation.

Before concluding the subject of design, it should be mentioned that some water heaters are being made for enameling in which two hemispheres or cups are drawn. These are welded together prior to enameling

for water heaters of small volume and to each end of a cylinder for larger units. Usually a large manifold is incorporated in one of the hemispheres for piping connections. Heat application can be made by either internal or external methods. Threaded fittings are tapped either before or after enameling, depending on design. If threaded previously, they must be re-tapped to remove scale.

Welding

The cylindrical shell body is butt welded, using a submerged arc or a resistance flash welder. In the case of the resistance arc weld and in submerged arc weld, in which 100% penetration is used, the excess metal must be removed by scarfing or grinding prior to enameling. It is possible to submerge arc weld with approximately 90% penetration and obtain a weld which requires no special metal preparation prior to enameling; however, this must be closely controlled, or it will lead to underpenetration and the formation of leakers or weak welds.


The internal fillet weld of flue to base is usually submerged arc welded

and if correctly done requires no special grinding; hand welding is not satisfactory. This weld can also be made externally by using a rod, as can the external weld of the plus head to the shell. In the case of welding the flue to the base, prior to enameling, it is recommended that internal welding, using the submerged arc weld, be used in place of the external weld as the formation of an internal crevice is prevented. Projection welding of spud attachments is desirable where closely controlled.

Following enameling, one weld is necessary in the case of external flue construction; two welds are necessary in the case of internal construction where the flue is welded to the base prior to enameling, and three welds are necessary in the internal flue construction where the flue is enameled separately from the base. These welds may be made by hand or automatically. In the case of gas or oil-fired heaters, a skirt comprising the fire box is usually welded on at this time, although in some instances the sheet is cut to include the skirt and this remains as a portion of the shell body

to Page 133 →





**what
does
your
metal
cleaning
cost?**

34¢ per part may be economical!

12/3¢ per part may be too much!

You may be looking at cleaning department costs and saying: "that looks about right . . . it used to cost us a lot more!" Would you like to know, for sure, that your cleaning costs are just as low as they can be . . . with excellent results?

Many present day users of Cincinnati Cleaning machinery thought their former methods were modern . . . their costs low . . . their production high — until a Cincinnati cleaning unit proved savings of 60, 66, 75 and 81 percent in time and labor . . . along with production increases up to 200 percent!

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What qualities of
USS VITRENAMEL make it
ideal for porcelain-
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USS VITRENAMEL has excellent
metallurgical and mechanical properties
—uniform flatness and formability—and
a specially prepared surface texture.



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TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL



Cutting 0.001-inch ceramic coated stainless steel shim stock on a conventional paper cutter. (Scissors serve just as well.) Ceramic coating does not fracture along the edge when cuts are made.

finishfotos

Ceramic coated shim stock

provides for excellent electrical insulation

by Gilbert C. Close • WESTERN EDITOR

AS a direct result of their extensive work in applying ceramic coatings for the aircraft industry, California Metal Enameling Co., Los Angeles, has perfected a technique for applying a very thin ceramic coating on very thin stainless steel sheet, which is subsequently used as shim stock where the shim must provide excellent electrical insulation between the surfaces it separates.

Stainless steel foil base

Stainless steel foil 0.001-inch thick is used as the base material. This foil is first thoroughly degreased,

then given a special surface treatment which will assure excellent adherence of the ceramic coating. The coating is applied approximately 0.0007-inch in thickness on each side of the foil, then fired at 1850° F.

After coating, the shim stock may be bent sharply or crumpled to a

Here a piece of ceramic coated stainless steel shim stock has been sharply "creased" with the fingernails, then straightened to show the undamaged condition of the coating. Repeated bending causes metal fatigue failure before the coating is ruptured or damaged in any way.

wad in the palm of the hand without rupture of the coating. In fact, metal fatigue will cause breakage of the foil before a coating rupture takes place.

A small sheet of this material inserted between metal surfaces provides excellent electrical insulation at all times.





Luxurious Comfort

by



NATIONAL AUTOMOTIVE FIBRES, INC.

Multiplicated* cushions and backs with FOAM RUBBER inserts

N.A.F.I.'s exclusive Multiplying Process makes possible elaborately, custom tailored, luxurious seat cushions and backs with foam rubber inserts. N.A.F.I.'s cushions and backs are the result of years of automotive seat experience and over 20,000,000 padded upholstery assemblies.

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Another advantage is the complete elimination of costly hand stuffing. Multiplicated cushions and backs are available in pipes of two inches and wider; and in any combination of widths.

N.A.F.I. invites you to discuss your trim problems with their highly qualified automotive interior engineers.

*An exclusive N.A.F.I. Patented Process.

SUPERIOR FEATURES

- NO BAGGY SECTIONS
- CONTROLLED FULLNESS
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- COMBINED DURABILITY WITH LUXURY
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NATIONAL AUTOMOTIVE FIBRES, INC.

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Subsidiary: Canadian Automotive Trim, Ltd.
Windsor and Ajax, Ontario, Canada

February · 1955

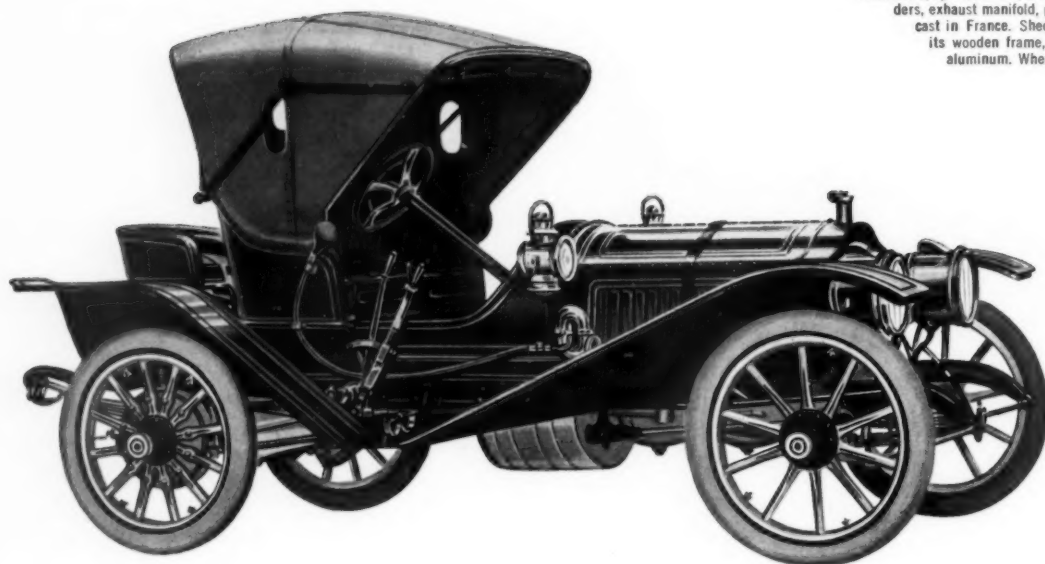
**SPECIAL
PACKARD SECTION**

Finish

THE MAGAZINE OF
Metal Products
MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

Your 1909 Packard "Thirty" Runabout sold for \$4200, with top, windshield, special colors, etc., extra. The car's four cylinders, exhaust manifold, pistons and piston rings were cast in France. Sheet aluminum panels covered its wooden frame, and fenders were made of aluminum. Wheelbase 123½", tires 36" x 4".



Ask the man who owns one.....



THIS WAS MORE than an automobile. To many a successful man it was a symbol of his achievements. Frequently, from the mere fact of possession, the Packard served to project the personality of its owner in a way that filled a soul-satisfying need.

The man who drove a 1909 Packard found in this magnificent car a visible expression of his own creative nature . . . an expression in line and color . . . in pleasing line . . . and warm, appealing color. Who then could measure its

true value? Wisely, the men who made and sold them said . . . "Ask the man who owns one . . ."

Today, as in 1909, the Packard name once again becomes a subtle, magic sound, a romantic symbol.

The Packard star is rising. Look closely and you will observe that it glows with a wondrous new light . . . the soft reflections of time and experience are blended with the sparkling colors of youth, spirit and enthusiasm. The Packard star is rising.



REG. U.S. PAT. OFF.

RINSHED-MASON COMPANY

DETROIT 10, MICHIGAN
ANAHEIM, CALIFORNIA
WINDSOR, ONT., CANADA

We are proud indeed to be associated with Packard as a major supplier of lacquer colors and undercoats. R-M has long been one of America's leading manufacturers of fine lacquers, enamels and undercoats for automobiles, trucks, farm equipment, appliances, and numerous other products of industry. We invite your inquiry. Ask about our color styling service.

THE PACKARD STORY

THE NEW PACKARD PROGRAM

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ENGINEERING by William H. Graves.....	P-11
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ACKNOWLEDGEMENT

The editors of *finish* desire to give thanks and credit Packard executives and to plant management and other personnel for furnishing information and outlining production operations in the Packard plants. Many others in the organization not listed here have our thanks for their willing cooperation.

PACKARD CENTRAL OFFICE

Neill S. Brown, General Manufacturing Manager
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John G. Anderson, Material Handling and Packaging Engineer, Manufacturing Staff, Packard Division
Joseph E. Dumas, Manufacturing Staff Assistant
Jack J. Sendoykas, Manufacturing Staff Assistant

CONNER PLANT

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William Vaughn, Superintendent, Body-In White
George McCarthy, Superintendent, Paint
Carl Ramey, Superintendent, Trim
William Coon, Superintendent, Final Car

UTICA PLANT

George W. Deislinger, Plant Manager, Utica, Packard Division
James J. Rath, Assistant Plant Manager, Utica, Packard Division
Raymond Boundy, Superintendent, Quality Control, Utica, Packard Division

This special 68-page Packard section forms the center of a 156-page February 1955 issue of *finish* magazine.
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Dana Chase Publications, Elmhurst, Illinois
 PRINTED IN U. S. A.

EDITOR'S INTRODUCTION

The Packard division of the Studebaker-Packard Corporation has undergone a drastic marketing and manufacturing revolution in the last two years since James J. Nance became president in 1952. In October of that year a program was launched to regain the pioneer car manufacturer's position of leadership in the fine car field. The program brought sharp changes in management policies and attitudes, sweeping changes in product and personnel, daring dealer reorganization and product pricing and complete modernization of facilities.

The introduction of Packard's 1955 models in January was the final step in this program. Many eyes of industry are on this company which has a production target this year 300 percent over its 1954 performance.

Did Packard stick its neck out, and did it take greater risks than necessary under today's strongly competitive and cost-conscious production conditions? To find some of the answers with their broad implications for every industry, *finish* Magazine has undertaken a thorough study of the new program. A complete report including exclusive interviews with president Nance and other top management men, photo coverage of the Utica V-8 engine plant, complete coverage of the new Conner body and assembly plant (from incoming steel components to the final inspection line) appears on the following pages of this sixty-eight page feature.

In over eleven years of publication *finish* previously has presented only five similar complete special sections devoted exclusively to individual companies in the field of Fabricated Metal Products. One of these covered a unique application for steel in the building field, and four were devoted to outstanding plants and organizations in the home appliance field. This sixth in the series steps into the automotive industry, as the number one user of steel in the metal products field—an industry which attracts the attention and interest of everyone interested in industrial development and business trends.

Our editors feel that there is material of interest in the new Packard facilities for every fabricator and producer of metal products.

It is our sincere hope that every reader will find material on the following pages that will prove both interesting and helpful.

Dana Chase
 EDITOR AND PUBLISHER

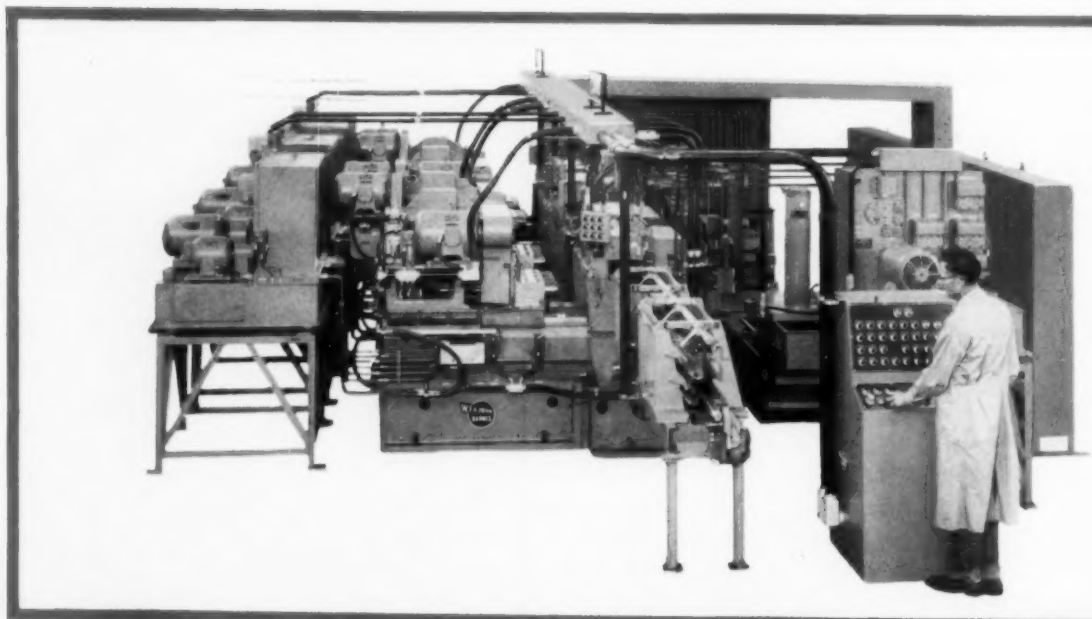
1899 Packard



A PART OF PACKARD'S

NEW MANUFACTURING FACILITIES

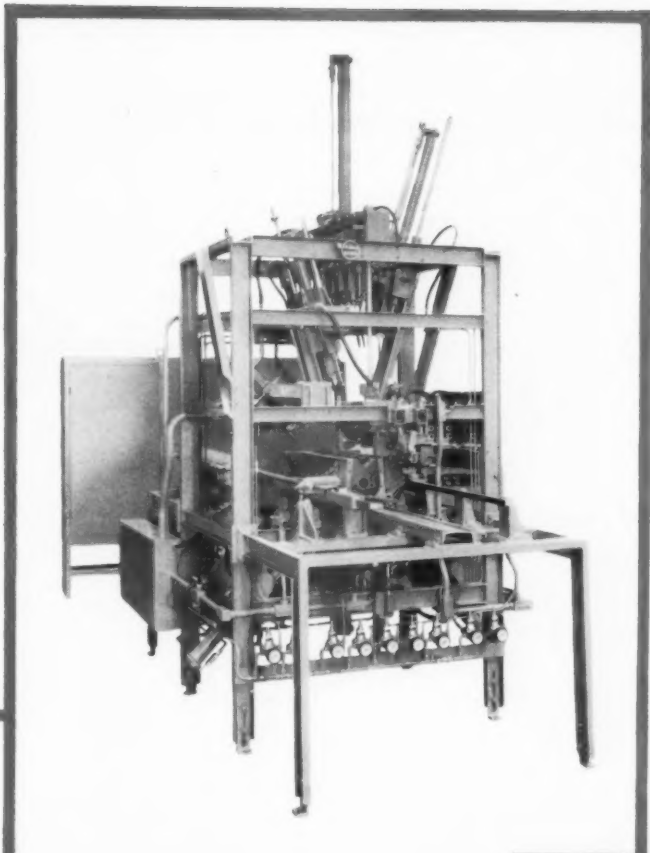
★ We congratulate Packard on completion of their new manufacturing facilities. It has been a privilege and a real pleasure to have had a part in providing equipment for a company that has contributed so much to the advancement and enjoyment of the motoring public. The photos shown here are representative of the many machines designed and built by W. F. & John Barnes for Packard.



SPECIAL AUTOMATIC BORING MACHINE — Finish machines V-8 cylinder head valve seats and stem holes. Corrective operations after boring, reaming, and seating operations are eliminated by holding total concentricity within .0005" (total indicator reading).

Builders of Better Machines Since 1872

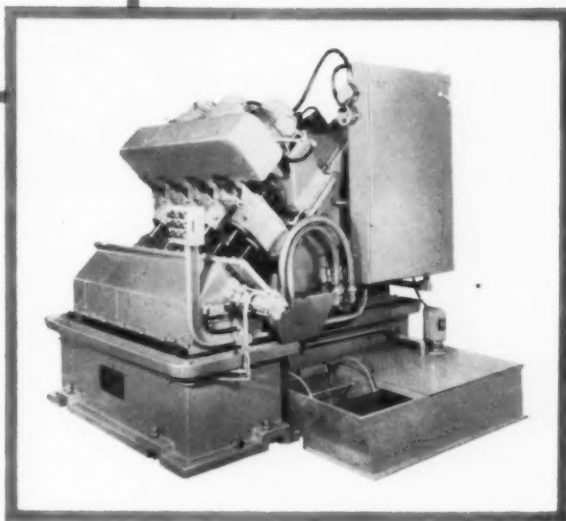
MULTIPLE SPINDLE DRILLING • BORING • TAPPING MACHINES



Packard

AUTOMATIC PROBE STATION — Test probes 36 oil holes in cylinder blocks for obstructions. Each probe operates independently of others and if obstruction is encountered, a light on master panel indicates exact hole.

Designed and built by
W. F. & JOHN BARNES CO.
AUTOMATION DIVISION



**KRUEGER-BARNES MULTIPLE
SPINDLE BORING MACHINE**—
Semi-finish bores connecting rod
bearing holes. Both ends of four rods
machined simultaneously. Oper-
ator loads and unloads work pieces
while machine is in operation.

KRUEGER-BARNES
Corporation

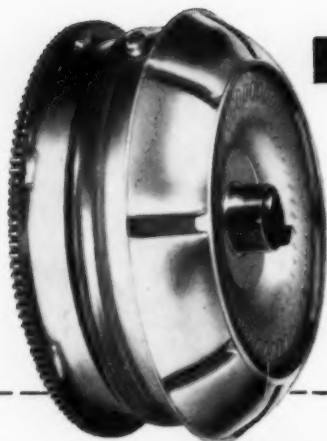
1469 E. GRAND BLVD., DETROIT 11, MICHIGAN

W. F. & JOHN BARNES COMPANY • 425 S. WATER STREET, ROCKFORD, ILLINOIS

AUTOMATIC PROGRESS-THRU AND TRANSFER TYPE MACHINES

finish FEBRUARY • 1955

P-5

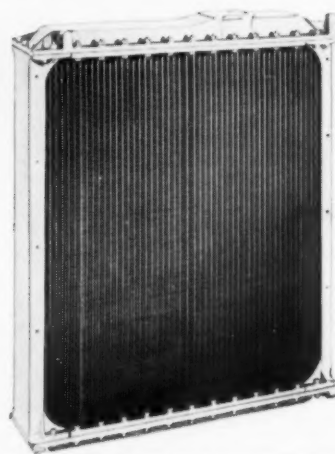


LONG TORQUE CONVERTERS

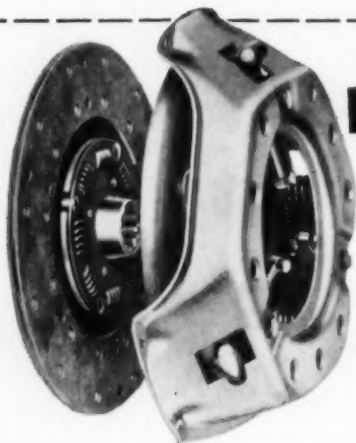
Here's a package that combines clean design, low-cost production and excellent performance. Long torque converters have velvet-smooth pickup and infinitely variable torque multiplication. Air-cooled . . . simplifies transmission system. Fabricated almost entirely from stampings . . . keeps unit cost low!

LONG RADIATORS

... *THE* name in radiators since 1903! Recognizing Long's superior ability in the field of heat exchange, leading manufacturers have equipped millions of vehicles with Long radiators. This equipment spans the entire range of size and capacity . . . from the smallest passenger car to the heaviest-duty commercial, farm and military vehicles.



LONG CLUTCHES



Rugged and dependable, Long clutches provide effortless shifting, smooth power flow. With Long's semi-centrifugal design, torque capacity increases as speed increases. That means less slippage, less wear, low pedal pressure . . . *longer service!* Since 1922, Long has provided heavy-duty clutching to leading vehicle manufacturers.

LONG MANUFACTURING DIVISION
Borg - Warner Corporation
DETROIT 12, and WINDSOR, ONT.



CLUTCHES • RADIATORS • TORQUE CONVERTERS • OIL COOLERS



faced with declining sales and a crumbling dealer organization.

The company's board of directors went to James J. Nance, then president of Hotpoint, Inc. He had brought that General Electric affiliate from ninth to third in the appliance industry in a period of six years. Elected president of Packard in June, 1952, Nance announced a program in the fall of that year to revitalize company operations.

The objectives of his Packard program were:

1. To re-establish Packard in the luxury car field and to re-introduce the Clipper for the medium-price field;
2. To put together a new, young management team;
3. To modernize manufacturing facilities and bring out completely new models by 1955.

Also, they frequently mention another objective. Believing that the days of progress for single line producers were numbered, they said that they hoped to make Packard an attractive partner for a merger that would result in a full line producer.

In discussing the program, Nance said:

The 1955 car introduction has a double significance. It marks the end of one phase of the program for

The new Packard program

AN INTERVIEW WITH *James J. Nance* • PRESIDENT, STUDEBAKER-PACKARD CORPORATION, DETROIT

by Dana Chase • EDITOR OF FINISH

finish

With the introduction of the new Packards and 1955 Clippers the program launched two years ago to regain Packard's former position of dominance in the fine car field was completed.

The cars were the end-result of the program which brought new manage-

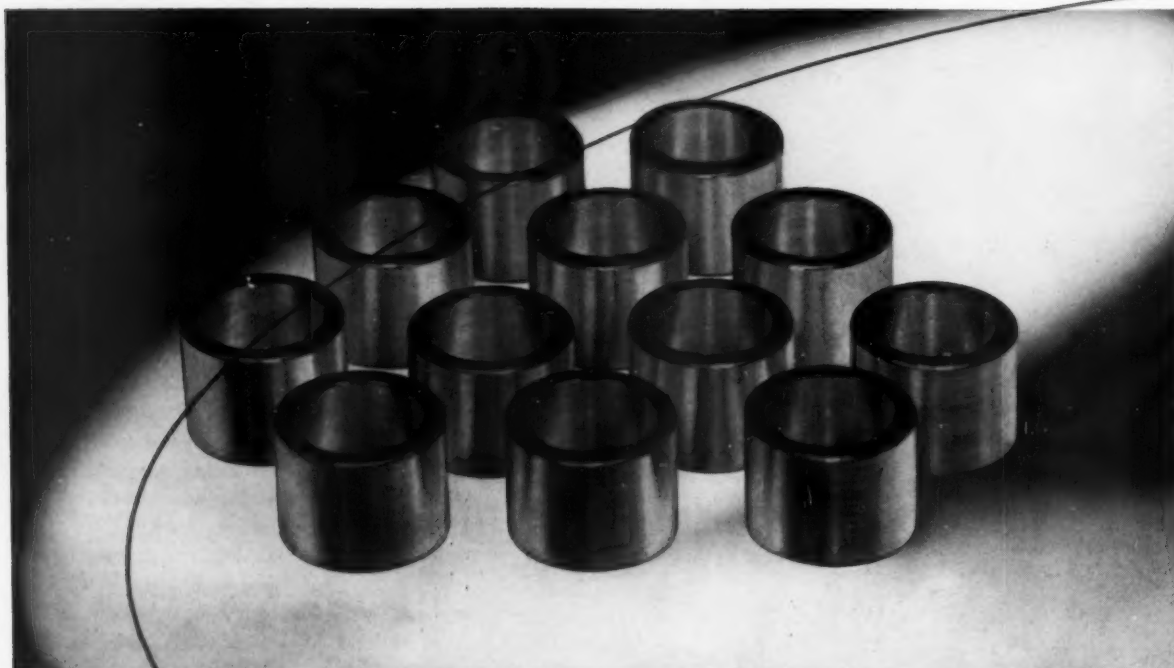
ment and new facilities to the company.

Packard dominated the luxury car field until 1935 when, during the depression years, it abandoned the luxury field to bring out lower priced cars, in keeping with economic conditions. When competitive times again came to the automotive industry, Packard, though, in a sound position financially with no debt, was

Packard, and second, it marks the beginning of another program phase with new objectives for the Packard division as a part of the Studebaker-Packard Corporation.

The new cars are the first that have been completely designed, engineered and produced under this new program. Whether they achieve their objective or not will be up to the

to Page P-64 →



these requirements in mind...

data for comparison

Part	Bushing
Machine	1 1/4" Six Conomatic
Tools	100% Carbide Tipped
Material	Stainless Steel Tubing
Stock Size	1 1/4" OD; 3/4" ID
R. P. M.	{ Work Spindle — 1033 Opposed Spindle—1048
Time	{ 7 Seconds per Cycle 3.5 Seconds per Piece



So varied are the demands on multiple spindle automatics it is impossible to design into one model — or a number of models — all the facilities that will satisfy every requirement. To excel in any range of work the design of a machine of this type must be directed toward that work.

Cone's new General Datalog lists over forty CONOMATIC models that are designed with these requirements in mind.

For any range of work, Conomatics are built to more efficiently serve the latest cutting tool materials.

Conomatic }

CONE AUTOMATIC
MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

Manufacturing . . .

AN INTERVIEW WITH *Ray P. Powers*

• VICE PRESIDENT OF OPERATIONS



Packard found that the problem of modernizing its facilities was one that could not be approached on a gradual improve-

ment basis. It was necessary to act and act quickly, because in its old plants, the company was suffering unreasonable cost penalties. These penalties were especially painful where materials handling was concerned. Some of the Packard buildings were 45 years-old, and four and five story structures, in which efficient materials handling procedures were impossible to practice.

Today, Packard and Clipper cars are being built in the most modern plants in the industry, and Packard is finding that the main advantage in being in up-to-date facilities is that the company is able to capture the cost savings that come from efficient procurement, scheduling, handling, loading, storage, inspection and other functions related to getting materials into the final product.

The basic advantages realized from combining body, final assembly and sub-assembly operations into a single building is that the arrangement has lent itself to appreciable cost reductions through materials handling, automation, improved production methods and lower maintenance costs (in that order).

The overall modernization and improvement program had three objectives in seeking to remove all car building operations from old multi-story plants into modern, single story facilities: (1) New standard of quality, (2) Competitive manufacturing methods, (3) Flexibility of production suited to the manufacture of luxury cars in controlled volume.

The program settled upon contemplated a separate plant to house production of new V-8 engines and a facility for body production and final car assembly.

The first step was in February a year ago when the company began transferring the manufacture of engines, axles, transmissions and chassis components to a modern 1.5 million square foot plant at Utica, Michigan, north of Detroit. Over 1000 new machines were installed in the plant in three straight production lines. Manufacture of the new V-8 engines began in November.

The second step came July 1 in taking over a million square foot plant on Detroit's east side, where bodies had been made by a supplier since 1946. This returned the company to the manufacture of its own car bodies for the first time since 1941. Previously the company had crafted them for 40 years. With its own personnel Packard continued to make 1954 bodies there until September 16.

The third step commenced when last fall a two-month assignment was tackled in this plant. It called for bringing in modern equipment and rearranging production lines into a body and car assembly plant. With sub-body assemblies, it was the first such combination facility in the industry. The first 1955's came off the lines in mid-November for the build-up of dealer stocks in advance of the January announcement. In the million square feet in this plant, Packard carries out car building operations which formerly required three million square feet.

Almost all heavy work has been eliminated by use of modern hand tools, welders, conveyors, and other mechanized handling devices. As an

example of the new efficiency, automobile floor pans formerly moved through 12 fixtures and were transferred by hand between them. Now they are mechanically transferred and processed through only three machines.

Although the key to operations in both new plants is scheduling and plant layout using new techniques, perhaps the most important new approach to be employed is in quality control, allowing quality manufacturing standards not possible before.

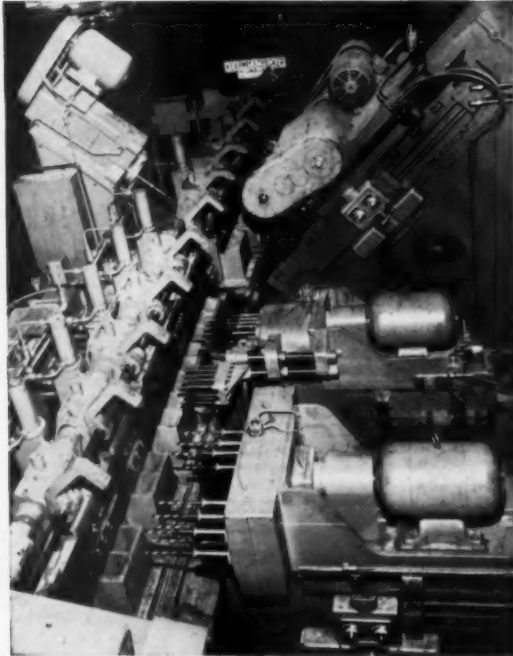
First, the plant was laid out so that final car assembly, final paint, final repair and shipping lines are all parallel. This enables quality control personnel to step only a few feet across lines to get at the source of any trouble. Secondly, a system of transmitting quality control and inspection information to a central point from individual stations throughout the lines for correlation allows constant surveillance of production. The manufacturing management's viewpoint is that you can't inspect quality into the cars at the end of the line, you have to build it in before the cars get to the final stage.

To carry out this program, a quality control group was set up at Packard which reports directly to the vice president of operations, rather than the plant manager, and has authority to reject any part, material or even finished cars which

to Page P-64 →



VICKERS[®] HYDRAULICS Helps Cut Costs at PACKARD . . . on Wide Variety of Jobs in New V-8 Engine Plant



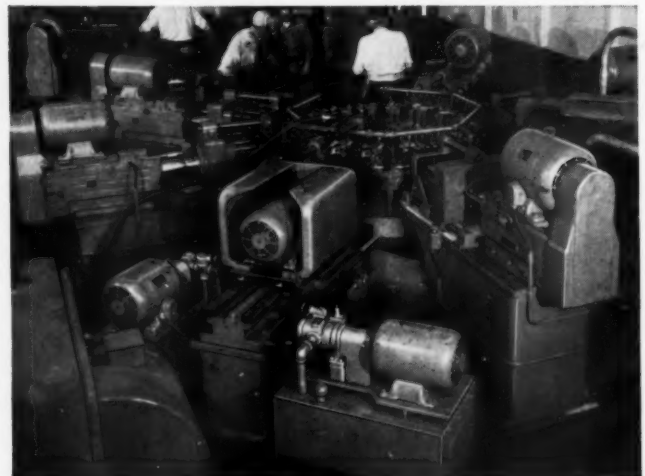
Kearney & Trecker machine for drilling and counterboring bearing caps. Note Vickers Traverse and Feed Cycle Control Panels visible on two heads; advantages include smooth and constant feed rates, easy adjustability, compactness and simplified installation.



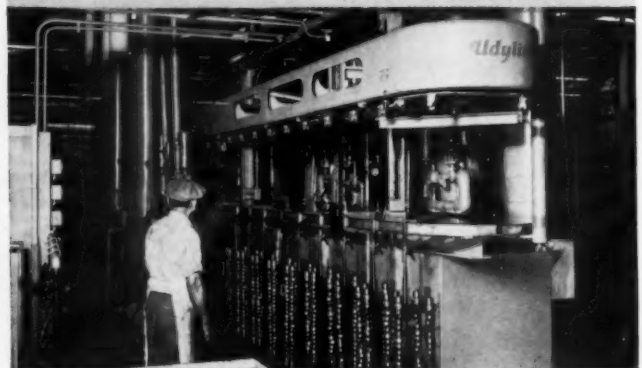
Three Greenlee Transfer Machines in automatized cylinder block line use Vickers Hydraulics. Compact Vickers Traverse and Feed Cycle Control Panel shown on head assures smooth and constant feed rate regardless of fluctuations in tool resistance or changes in hydraulic pressure or volume.

Representative of the many and varied production machines equipped with Vickers Hydraulics in the new Packard V-8 Engine Plant at Utica, Michigan are those shown here. Among the advantages of Vickers Hydraulics are: (1) simplification of design, (2) adaptable to automation, (3) ease of providing interlocks and overload protection, (4) ease of maintenance with minimum down time. Equally important, Vickers Hydraulics gives you the benefits of a nation-wide and full-time field engineering and service organization.

The Vickers Application Engineer near you will be glad to show you the benefits you can obtain by using Vickers Hydraulics. Write for a copy of Bulletin 5002.



Michigan Drill Head Co. 8 station dial machine for connecting rods and caps. Vickers Hydraulic Power Units shown are complete hydraulic "packages" (pump, electric motor, valves, oil reservoir, filter, etc.) that simplify design, and save installation and maintenance costs.



Udylite Automatic Processing Machine saves space and assures more uniform quality by using Vickers Hydraulics to raise, lower and transfer cam shafts through cleaning, coating and rinsing baths in "Lubriting" process.

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Application Engineering Offices: • ATLANTA • CHICAGO AREA (Brookfield) • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS • NEW YORK AREA (Summit, N. J.) • PHILADELPHIA AREA (Media) • PITTSBURGH AREA (Mt. Lebanon) • ROCKFORD • ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA • WASHINGTON • WORCESTER

7109

Engineering . . .

AN INTERVIEW WITH *William H. Graves*

• VICE PRESIDENT AND DIRECTOR OF ENGINEERING



Two years ago, a new product philosophy was approved at Packard which gave the engineering department a green light it had not had since 1935. The 1955 models with more changes than in any other single year in the company's history, and with three major mechanical features which are automotive "firsts", are the result.

Basically, new product development was built upon three distinct ideas:

1. Offering cars of advanced and distinctive styling with outstanding quality. We are firmly convinced that in the automobile business there is plenty of room for individuality. We believe this because a sizable segment of the American public does not want to live in a house that looks like his neighbor's; does not want to dress like the next fellow; eat in the same places, or drive the same kind of car. If there is one thing that makes an American different from other people, it is his belief in the importance of being an individual. Therein we believe is the role our cars will play in the automobile business.

2. Offering cars of advanced design and with advanced features not available on other makes. The emphasis during recent years has been centered on mechanical improvement, with V-8 engines of increased horsepower, power brakes, power steering, to meet new traffic conditions of the postwar era. This emphasis is currently being supplemented by a strong element in styling by offering wide and varied choices of color and trim schemes to meet the grow-

ing desire on the part of the consumer to express individuality in his car. We believe the next major move in automobile merchandising will be directed toward providing the customer with greater riding comfort. It was because of this strong belief that new standards of riding comfort would be the next major cycle in engineering development that the decision was made to introduce the new Torsion-Level method of suspension.

3. Offering cars which would be the best in their classes in a return to the tradition of luxury car manufacturing.

In carrying out this philosophy, two major objectives were set up: designing two new lines of cars to be introduced in 1955; and establishing an advanced product planning program for 1956-57-58.

The program undertaken showed rapid progress. A new young styling team was put to work. Average age of the group was 28. A new \$2 million styling and research laboratory was completed. An eight year testing program on the new V-8 engines was accelerated with the final test completed last October of a 25,000 mile endurance run at the company's Proving Ground. Supervised by the American Automobile Association Contest Board, a test car equipped with a pre-production V-8 engine completed the run in just under 10 days at an average speed of 104.7 miles per hour, exceeding every distance record from 3,000 to 25,000 miles.

The engineers went to work immediately to design a new type of transmission and to perfect the new Torsion-Level suspension which eliminated all coil and leaf springs.

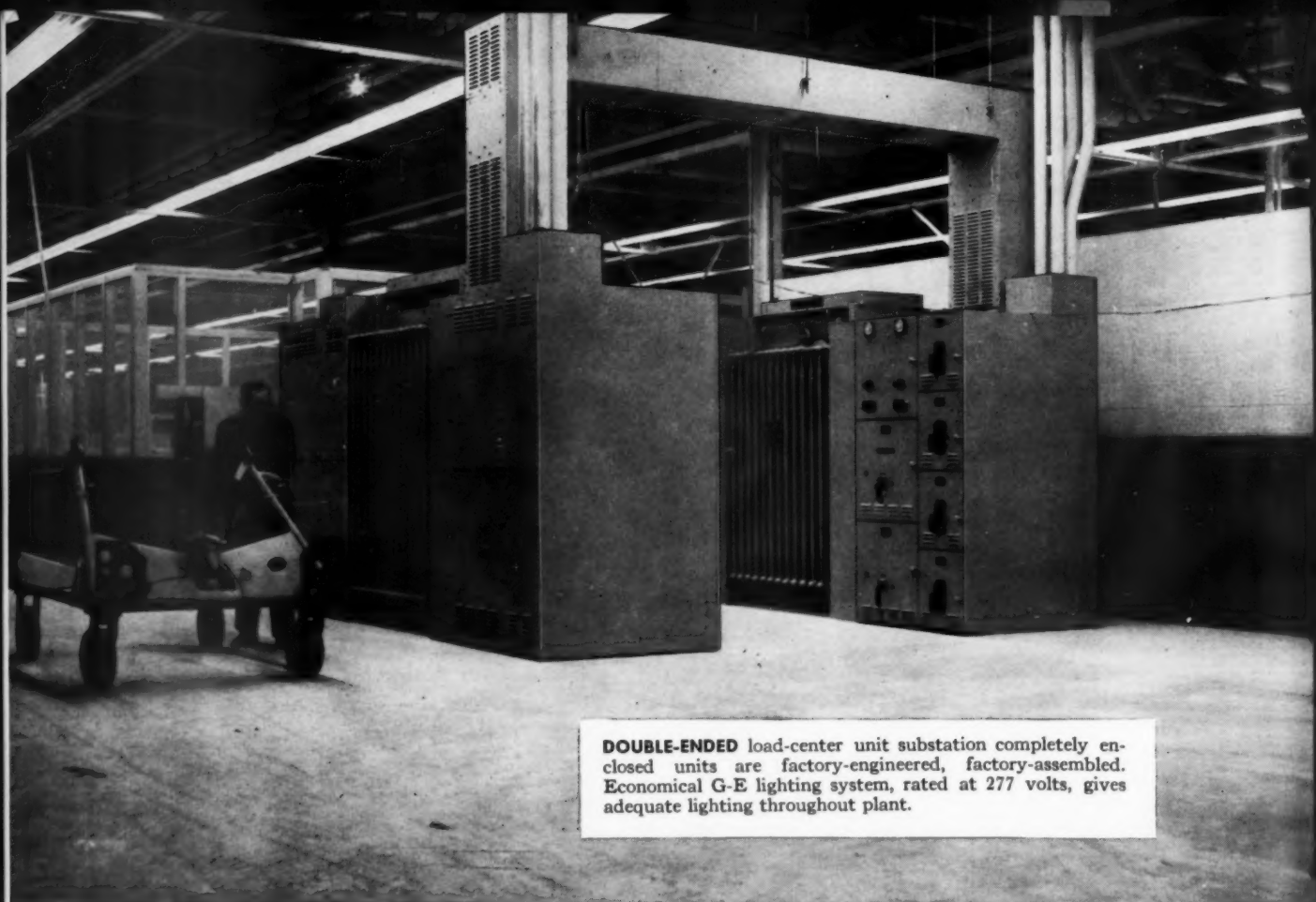
An experimental car program was initiated to test public reaction to various styling features proposed for the 1955 models. The Pan American sports convertible was shown in 1952, the Balboa hardtop with reversed rear window in 1953, the full-sized plastic Panther-Daytona convertible in 1954, and currently the "Request" hardtop with classic front end grill is the leader in Packard's automobile show exhibits.

The results of this program are built into the 1955 models. We wanted in our new car an outstanding feature that engineers and automobile authorities regarded as essential to a fine automobile, a feature that had not yet been put on any production car in America. We have that in the new Torsion-Level suspension, in which, I believe, we have reached another milestone in car development that will take its place with the dozen or so great "firsts" that the industry has brought to the motoring public.

The free-breathing principle has reached its greatest application in the new V-8 engine. With our large engine having 352 cubic inches displacement, it is the largest engine that has been produced. Horsepower is 260 in the Packard line and 275 in the Carribbean, highest in the industry for 1955. However, we primarily worked for increased torque with high performance and power at the

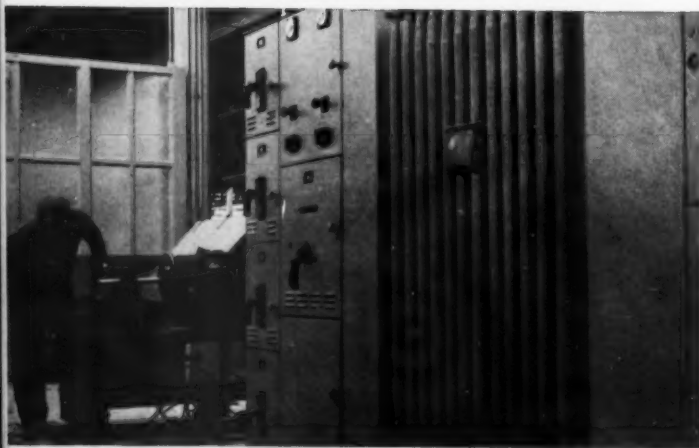
• to Page P-64 →





DOUBLE-ENDED load-center unit substation completely enclosed units are factory-engineered, factory-assembled. Economical G-E lighting system, rated at 277 volts, gives adequate lighting throughout plant.

G-E load-center system gives Studebaker-Packard economical, reliable power continuity



EACH TRANSFORMER of load-center units is rated at 750 kva, with voltage on the high side at 4800 volts.

TO GET POWER CLOSE TO LOAD, Studebaker-Packard Corporation uses a General Electric load-center distribution system at its Utica, Mich. plant. This method of power distribution allows the most efficient transmission of power at primary voltage of 4.8 kv to load-center unit substations, and then, stepped down to utilization voltages, to points of actual use.

Studebaker-Packard has found the G-E load-center system means:

- Lower cost with greater protection for feeder circuits.
- Less engineering and installation costs, with fully coordinated, factory-assembled substations.
- Greater flexibility, with provision to add units whenever load increases.
- Less voltage drop with short secondary feeders.

For further information, contact your nearest G-E Apparatus Sales Office. General Electric Company, Schenectady 5, N. Y.

651-6

Progress Is Our Most Important Product

GENERAL  **ELECTRIC**

Procurement . . .

AN INTERVIEW WITH *Albert H. Behnke*

• VICE PRESIDENT OF MATERIALS



Two years ago Packard had few established procedures and lacked uniform buying policies.

Today, the company has a system with flexibility and affording supplier cooperation and integration tailored to a planned production base, a program which looks to suppliers growing as Packard grows.

Faced with the problem of two new plants under construction at the same time a major model change was going forward, the materials division went through rapid reorganization of methods and personnel. Internally the program had these facets:

1. A reorganization of functions.
2. Infusion of new young executives in staff and purchasing activities.
3. New procedures for liaison with engineering and manufacturing.
4. Complete mechanization of reports and controls.
5. Switching of inventory control from the manufacturing division to the materials division.
6. Publication of a purchasing manual.

In these areas the best procedures from various companies inside and outside the automotive industry were put together in a streamlined system which brought the company up to date and at the same time met Packard's special needs.

Externally, in its relationships with suppliers, the company had a different problem. In simple terms, Packard had few friends among its suppliers. One early storm signal was the failure to get adequate ma-

terials following World War II, a time when all cars a manufacturer could make could be sold. The company did not reach production schedules comparable to its prewar position until the balance between production and sales had already been reached by the industry, and the tide was turning the other way.

The new purchasing program took the following forms:

The company immediately established a system of personal attention to each supplier representative. He is channeled through purchasing upon arriving at the plant and again upon his departure. The door is open to any representative to tell his story to the materials division.

A shirtsleeve approach by suppliers was encouraged. In fact, suppliers are expected to work side-by-side with engineers and foremen, with the aid of the purchasing agents, to solve production needs.

The research and development facilities of supplier firms were rapidly integrated into planning. Ideas generated within the company were taken to vendors to research for possible application.

A system of competitive bids was instituted for the first time with at least four bids required on any item. All bidding suppliers were informed of contract awards and the reasons.

The establishment of historic buying patterns was immediately undertaken, particularly for such items as steel and other raw materials. There had been no such purchasing record established with suppliers, which in part was behind postwar supply problems.

A program of decentralization of supplier sources was initiated not only to secure more favorable costs,

but also to widen the bidding base and establish the company as a major customer outside the Detroit area.

Without the successful completion of this program, operating vice president Powers is quick to assert that his modernization program and new car tooling could not have been carried out in the same year.

An example is the present system employed at the new car body and final assembly plant for incoming supplier items. On many major parts lead time is only three days. Some of the suppliers cooperating in this plan are 500 miles away. This compares with a lead time of as much as three weeks on the same items previously.

Packard's new manufacturing flexibility, of course, is predicated to a large extent upon the resources of its suppliers. One example was the introduction of the first tubeless tires as original equipment in November, 1953, and later as standard equipment in July, 1954. Because of close supplier relationships and controlled production volumes, it was possible to make the change to the tires in a matter of months. The adoption of torsion bar suspension on the 1955 models was another example where, with a Packard design, the company, in less than a year, was able to work with suppliers to design a new frame and new tooling to allow installation on the cars ahead of other companies.



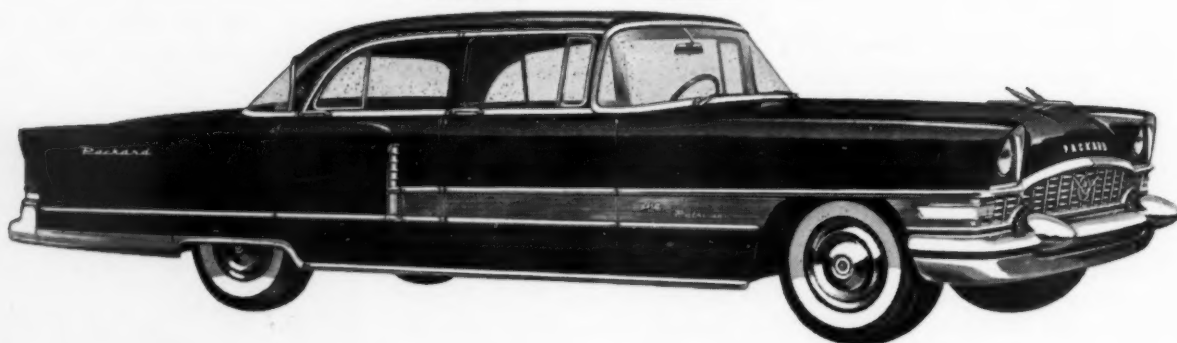
CHAMPION

joins the world in saying:



"More Power

to Packard!"



The distinguished new Packards of 1955 are great motor cars well worthy of the great name they bear.

And with performance more than matching its beauty, the new Packard made automotive history even before its public appearance. A 1955 Packard Patrician sedan—under AAA supervision—eclipsed every automobile distance-speed record in a 25,000-mile durability run at an average speed of 104 miles per hour!

Champion Spark Plugs played their part in this magnifi-

cent exhibition of stamina and speed just as Champions have served Packard almost from the beginning.

Because of this pleasant relationship through the years, the Champion Spark Plug Company proudly joins Packard's friends the world over in saying:

"More power to the great new Packard!"

CHAMPION SPARK PLUG COMPANY
TOLEDO 1, OHIO

CHAMPION

Marketing . . .

AN INTERVIEW WITH *Clare E. Briggs*

• VICE PRESIDENT OF SALES

Exclusive
feature
finish

When James J. Nance became president of Packard in June, 1952, there existed a weak dealer organization, lack of price identification in the market, insufficient product sales effort, lack of marketing perspective, low field organization morale, and management complacency.

Two years later as the company brought out its 1955 models, the company had become re-established in the luxury car field, planned to increase advertising expenditures 20-25 per cent over 1954, was entering network television for the first time on a large scale, had carried out an expansion of the dealer organization unprecedented in the automobile industry, and had 25,000 advance orders for cars, largest in company history.

Prior to 1935 the company had earned its reputation for turning out a quality product; it had adjusted successfully to the depression by trading down into the lower priced car bracket; it had met World War II defense requirements; but somehow it had failed to grasp the composition, thinking and character of the postwar market. A profitable balance sheet had fostered a false sense of security. The feeling was that product prestige and quality could overcome the lack of sales appeal.

The number of Packard buyers was decreasing, and the sad fact was that the prestige of the Packard name was being destroyed by application in too wide a price range. The crumbling market brought a substantial drop in the number of dealers.

What Packard has done is an example of the marketing strategy and tactics that can be applied to meet such a slipping market situation.

The following moves were made:

1. *Aggressive new young executives were brought into the marketing division.* Sweeping changes in personnel necessarily were required. Key supervisory positions were filled with leading executives from other companies inside and outside the industry. The requirement was a strong well-knit marketing team with dynamic thinking and team-play. Nance himself was known as a marketing strategist.

2. *The sales department got a new voice in engineering the product with sales appeal.* When you have strong competitors, it isn't enough to build a quality product. You must consider your prospective customer's dislikes and provide him with a choice of products that appeal. That means consistently altering your product to conform with a host of changing likes and dislikes, meanwhile retaining basic quality.

3. *Market analysis determined the salability of the product.* It rated well, but lacked the hard selling efforts behind it.

4. *The field organization was carefully surveyed.* Studies indicated dealer dislocation geographically in many marketing areas, dealer dissatisfaction with profit possibilities. New franchise terms were worked out, and special used car merchandising, business management, service and other programs for dealers were instituted.

5. *The product was moved back into the top quality class at the same time the Clipper was re-introduced in the medium priced field.* Indi-

vidual treatment in styling, interiors, equipment and engine size was given the two different lines.

6. *The field organization was expanded by 900 dealers.* This was accomplished between October and January of this last year, principally due to the pre-production interest in the new cars and the completion of the Packard program of facility modernization. About 500 of these new dealers were dual franchises with Studebaker in smaller communities following the combining of Studebaker and Packard into a full-line producer.

7. *The company's concept of dealer relationships was reiterated.* Basic in the thinking of Packard is the mutuality of interests between the factory and the dealer. Packard has been known as the "friendly factory" and has followed the policy of building cars only to the volumes that the dealers could sell.

8. *An entirely new approach in promotion and advertising was worked out.* It was based on bringing the cars out as individually designed with advanced features appealing to the great number of people who want a car different from their neighbor's. A new advertising agency with regional offices set up to service area dealers was brought in. Promotion plans were upped 20-25 per cent over last year, as the company underwrote its marketing year with a sales objective exceeding any year in the postwar period.





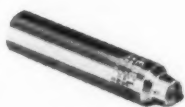
Pulling for Studebaker-Packard

Yes, the Flying Red Horse has served both Studebaker and Packard, individually, with Gargoyle lubricants and other petroleum products for many years. Now... he's ready to keep on pulling for the new team of Studebaker-Packard — to help build even better cars, faster — at lower costs.



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Congratulations to PACKARD

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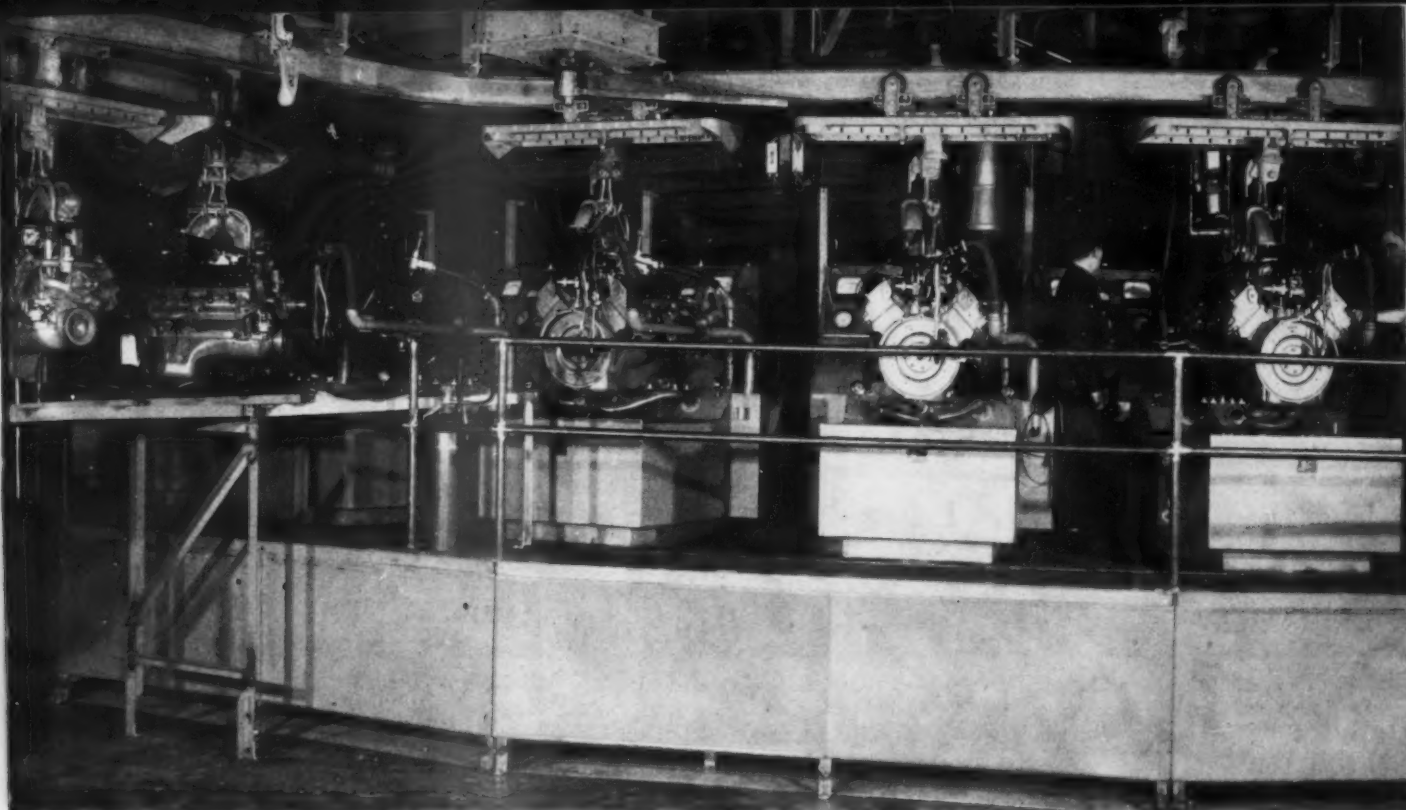
It is a pleasure to name
The Studebaker-Packard Corporation
as one of America's great
industrial organizations to which
machine tools and cutting tools
have been supplied by the
several divisions of this company.

★ ★ ★

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Machining, assembly and testing the Packard V-8 engine

a photo story of major operations at the Utica engine plant



Machining, assembly, and testing operations of the new Packard V-8 engines are being performed at the new Utica, Michigan,

plant. The lines are largely composed of special automated equipment.

The final engine assembly line is fed by six major machining lines: the cylinder line, crankshaft line, camshaft line, piston line, connecting rod line, and the cylinder head line.

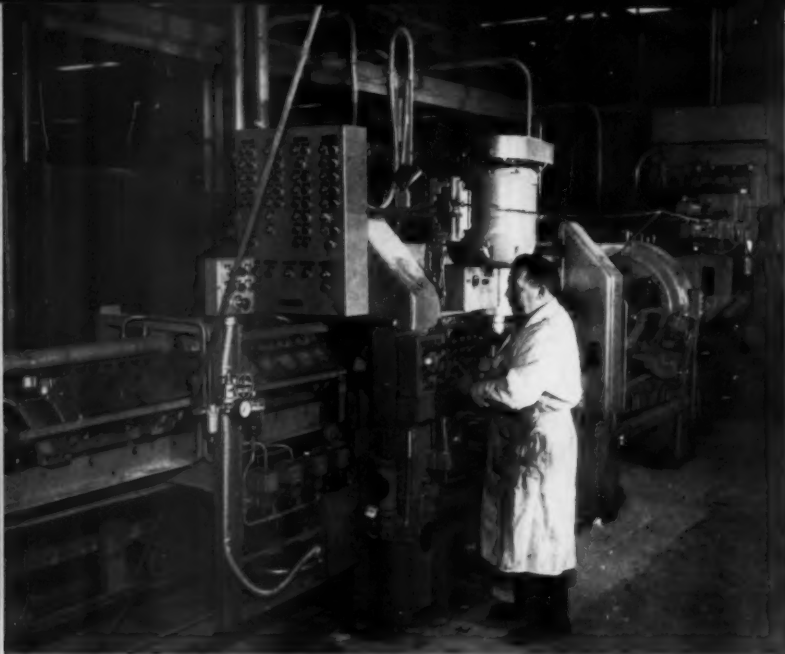
The first of four, multiple station Ingersoll transfer machines, is the starting point of the 800 foot automated cylinder block line. Inspected blocks are loaded and four locating pads are milled after which the blocks are automatically turned 180° for

boring crank bearings and drilling cam bearings. (See photo #1). Succeeding operations are: milling pan rail and bearing cap seats, broaching bearing cap seats, drilling, chamfering and reaming locating holes, in-

Above: Packard engines being tested on new rotary test stand. Engines suspended on a power and free conveyor enter the test stand at the left. Engine is connected to the individual test stand but remains suspended from overhead conveyor. Test stand rotates clockwise. Indications of motor performance on individual test panels enable engines to be indexed for balancing operation or repair. Completely tested engines shown at right and center will move out on the power and free rail in the foreground and be conveyed to the final balancing or repair areas.

spection and lastly, drilling ten holes. (See photo #2).

Following the four Ingersoll machines on the cylinder block line are three Greenlee transfer machines. The first and second machines have eighteen stations each and the third machine has fifteen stations. Blocks are automatically loaded into the first Greenlee through which they receive twenty-one machining operations, two rollovers, and an inspection. They are then loaded automatically with the pan rail down front end first into the second eighteen station Greenlee. (See photo #3). Sixteen different drilling, reaming, countersinking and chamfering operations, and one 360° turnover for chip disposal are performed in this machine. The blocks are inspected and automatically loaded into the fifteen station Green-



1. First of four multiple-station transfer machines. Cylinder blocks are loaded and four locating pads are milled. Then blocks are automatically turned 180° for boring crank bearings and drilling cam bearings.



3. In this machine 16 different drilling, reaming, countersinking and chamfering operations, and one 360° turnover for chip disposal, are performed.

lee machine. This machine is highlighted by a compound turnover fixture which lifts the blocks, carries them through two 90° turns, and places them endwise across the ways with the pan rail down. (See photos #5 and #8). Prior to and following this turnover tapping and reaming operations of tappet, bolt, oil, and other holes are performed. (See photo #4).

Adjacent to the cylinder block line is a Lapointe 50 ton horizontal

broach which rough and finish broaches the top, sides and joint surfaces, and rough and semi-finishes the half holes of the main bearing caps. (See photo #6). After further machining, inspection and washing the caps are assembled to the blocks and are checked for bearing sizes in a five station Air-O-Limit Comparator.

Conveyors then move the blocks to a battery of automatic cylinder honing machines where the blocks

are separated according to the size of bore. Automation moves the cylinder blocks through rough and finish honing operations. (See photo #7).

The piston line, which is also highly automated, features Sundstrand Automatic Stub Lathe. Pistons are automatically loaded and positioned, and receive eight machining operations of ring grooves and domes. Ejection is also automatic. (See photo #9).

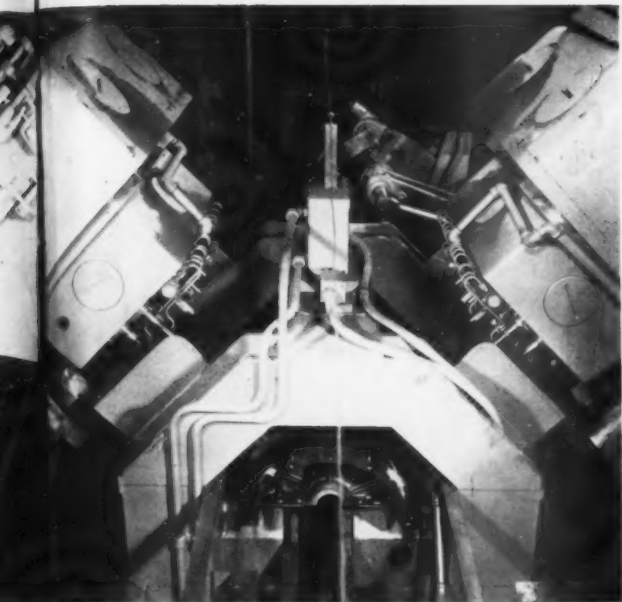
Piston balancing is capably han-

2. A battery of transfer machines performing milling and drilling operations on the oil pan face of the V-8 engine block. The blocks are moved from station to station automatically.



5. Compound turn-over fixture lifts the block, carries it through two 90° turns, and places it endwise across the ways with pan rail down.





4. Close-up view of 8th station (in 15-station transfer machine) showing stationary tapping spindles on left and right-hand heads (15 spindles on each head), with block between.



7. A battery of automatic cylinder honing machines. Automation moves cylinder blocks left to right with the rough honing operations in left background and the finishing honing operations in right foreground.

dled by a Morris fully automatic transfer type piston balancer. This machine receives pistons by conveyor, weighs the pistons and balances them by weight, making cuts when necessary. (See photo #10).

Two operations stand out on the camshaft line. One of these is performed on a Hartford Special 4 Station Vertical Trunnion Machine. The camshafts are automatically centered, drilled, countersunk, counterbored and tapped, then a Woodruff keyway

is milled. (See photo #15). A Norton multiple wheel grinder finish grinds five bearings on the camshaft in one operation. (See photo #16).

Connecting rods receive final machining operations on a Michigan Drill Head 8 Station Dial Machine. Here bolt holes are drilled, reamed, counterbored and countersunk. Lock slots in rods and caps are milled and squirt holes in the caps are milled.

Another major line is the crankshaft machining line. The initial

operation on the line is the milling of eight locating spots on the crank in a Sundstrand Special Crankshaft Mill. Crankshafts are loaded and progress automatically through the mill. (See photo #11). Further down the crankshaft line a Leland Gifford 8 Spindle Special Drill drills eight oil holes in the crankshafts. (See photo #12).

On the cylinder head machining line there is complete automation in

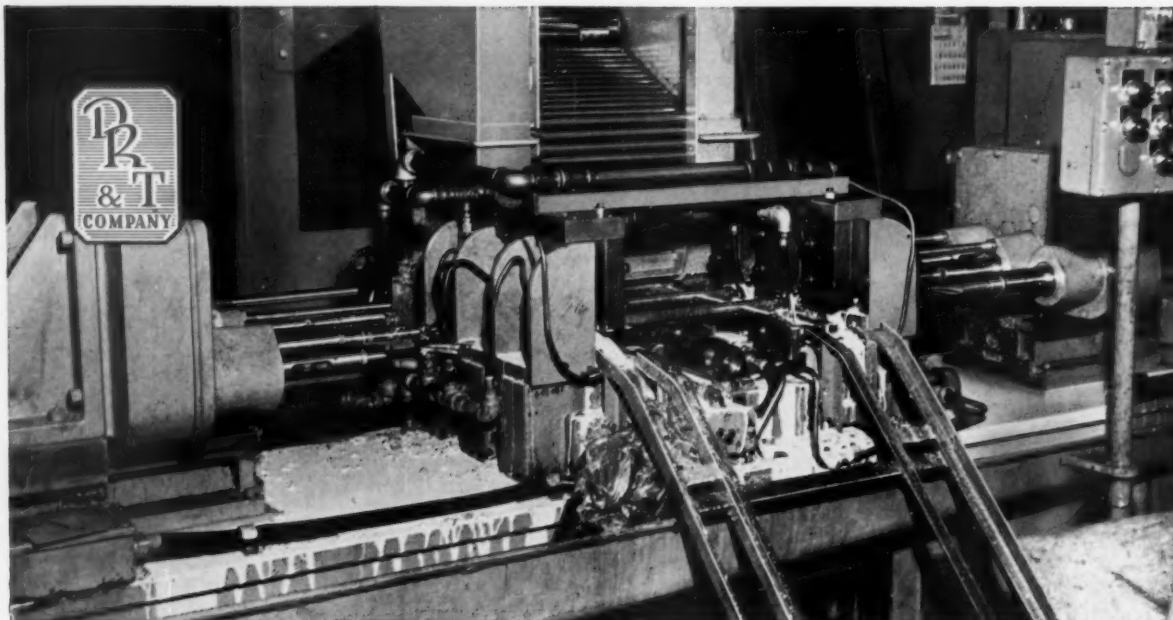
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6. A 50-ton horizontal broach is used to rough and finish broach the top, sides and joint surfaces, and rough and half-finish the half holes of main bearing caps.



8. Bird's eye view of V-8 cylinder block line showing automatic device (foreground) for positioning block. This view is looking toward beginning of the line which is approximately 300 feet in the background.





DETROIT REAMER CUTTING TOOLS for NEW PACKARD PRODUCTION

Pictured is the use of six Detroit Reamer cutting tools on an automatic horizontal machine at the Packard plant in Utica, Michigan. The machine is hopper fed and has right and left-hand motorized heads. Each head is equipped with three spindles that hold a combination counterbore and spotfacer, a radially relieved chamfer tool, and a spiral flute utility reamer.

The part being machined is the motor valve rocker lever shaft. After part is placed in first position, the rear spindles are used to simultaneously counterbore and spotface both ends of the shaft. Transfer of shaft is then made to second position where tools in middle spindles chamfer the holes inside and out. Final position of work utilizes tools in front spindles to finish ream the holes.

Detroit Reamer & Tool Company furnishes many other cutting tools of both standard and special types for other production operations at Packard. The following list of a few of these tools and their function, provides an abbreviated picture of the scope of cutting tools that can be furnished by Detroit Reamer to better meet your every metal working requirement.

- ① Packard Transmission control valve bodies of die cast aluminum are drilled and reamed with high speed steel drills, special step drills, carbide tip reamers, and special carbide tip step reamers.
- ② Motor connecting rods are made of steel forgings—carbide tip reamers are used for finishing piston pin holes.
- ③ The motor cylinder blocks of cast iron are drilled and reamed with carbide tip tools.
- ④ Motor cylinder heads of cast iron require such special tools as carbide tip subland drills and reamers, carbide tip core drills, combination reamers and chamfer tools.
- ⑤ The Packard transmission planetary case and cover plate are made of H.R. steel, combination subland drills and countersinks are used.

We are very proud of the fact that for a number of years Detroit Reamer & Tool Company has been selected as a supplier of cutting tools by this manufacturer of traditionally fine automobiles. Also, that our cutting tools are being used extensively in the production of their latest and finest models—the 1955 series of Packards.

For further information concerning standard or special cutting tools, write to:

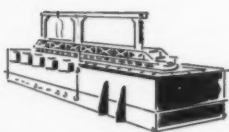
DETROIT REAMER & TOOL CO.

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Simplicity of design, durability of construction and the economies of accurate plating have built Udylite leadership in automatic plating equipment in a decade



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Udylite sales of equipment have mounted each year until today Udylite machines are in use in every country in the world where manufacturing in metal is important. In fact, the deliveries of Udylite plating machines in 1953 reached an all time high, and repeat orders were an important factor in this record.

Ingenuous engineering is one of the reasons behind the Udylite success story. Many Udylite machines have been in operation for 24 hours a day,

Official inspection of Udylite's 600th Full Automatic, 100 feet long, built to copper, nickel, chrome plate 3,000 cigarette lighters per hour.

seven days a week for years. And all of this performance with practically no replacements. In fact, the recommended spare part list for the Udylite machine totals less than one hundred dollars.

Udylite machines are being used today in plating hundreds of different products . . . from small telephone relays to bulky tubular furniture, and for almost as many different processes.

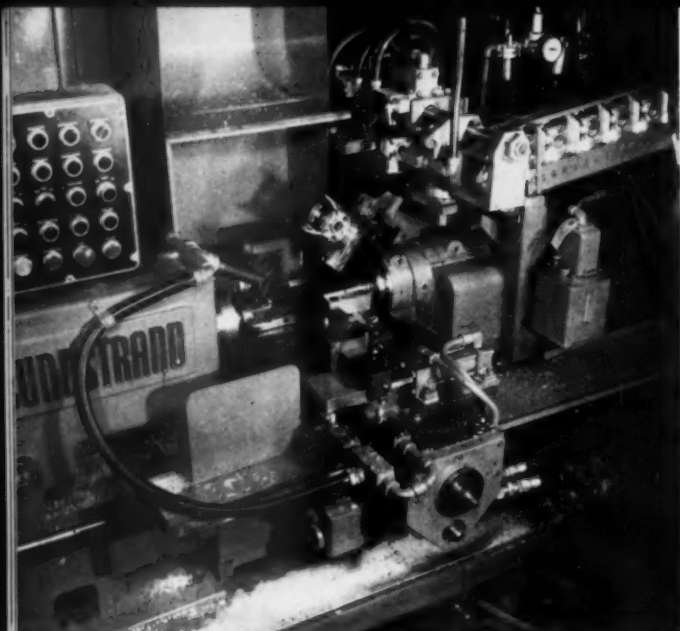
The Udylite Full Automatics engineered and built to suit the need have ranged in size from 20 feet to 500 feet in length. Udylite can furnish a machine for every plating or finishing problem.

If you have a metal finishing production problem, Udylite Full Automatic Equipment can help you.

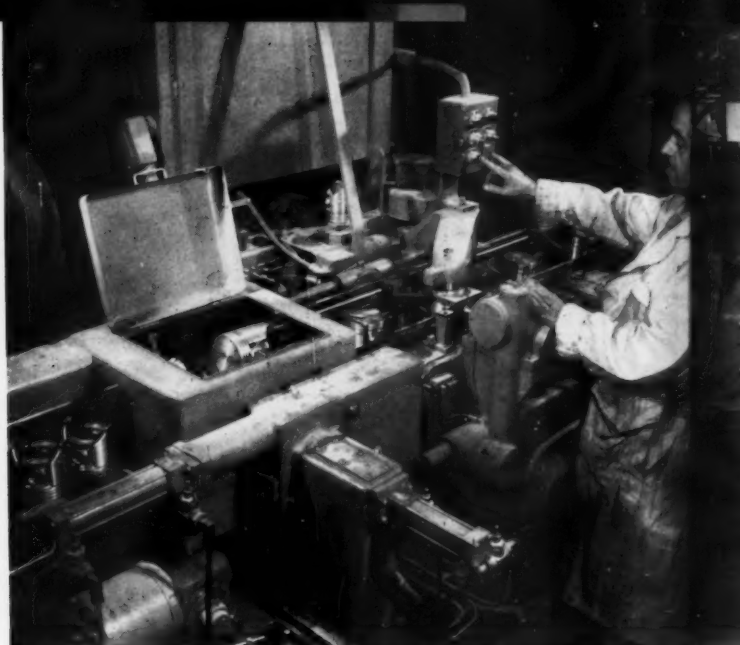
Write for the booklet "Udylite Automation in Plating" — the story of Udylite Full Automatics in industry today

THE
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DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER



9. Automatic stub lathe on piston line. Pistons are automatically loaded and positioned, and receive eight machining operations of ring grooves and domes. Ejections is also automatic.



10. Piston balancing is handled by fully-automatic transfer-type machine which receives pistons on conveyor, weighs the pistons, and balances them by weight, making cuts when necessary.

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three W.F. and John Barnes transfer machines, which have respectively 19, 18 and 5 stations, and prior to them a 12 station Ingersoll transfer machine.

In the 19 station Barnes holes are drilled for bolts, spark plugs, push rods, valve covers, water system, valve guides and other purposes. (See photo #13). Also done are spotfacing, milling, countersinking, core drilling, boring and reaming

operations. Loading and unloading is automatic. The 18 station Barnes drills, countersinks, and taps holes for exhaust manifold, intake manifold, oil gallery and water pump. It also taps holes for spark plugs, and valve covers. Loading and unloading is again automatic. (See photo #14).

All these completed parts are conveyed from their respective machining areas to the engine assembly line. Cylinder blocks are automatically unhooked from their conveyor

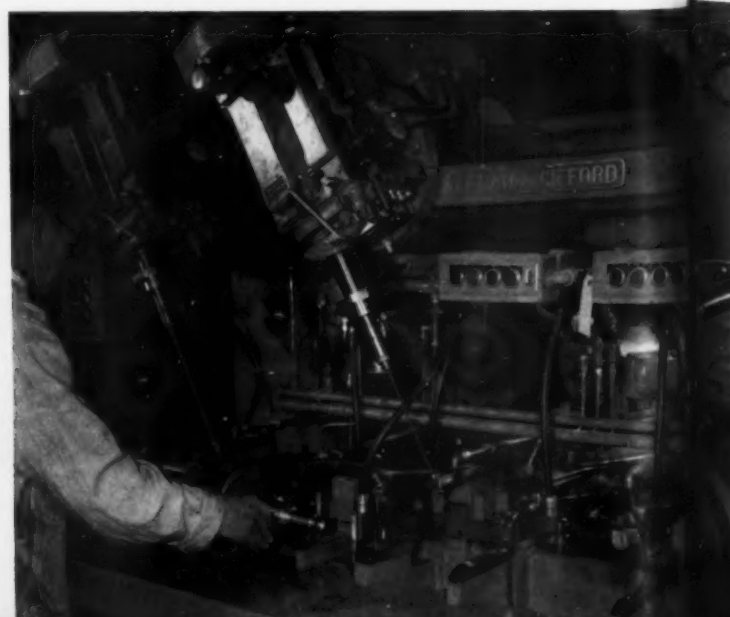
and slide down a roller conveyor to a convenient position at the beginning of the assembly line. The blocks are then placed in fixtures on the pedestal type assembly line with the pan rail up, ready to receive the succeeding parts.

The various components, each of which is preselected for a certain block, are delivered to their proper point on the line at the proper time by means of teletype scheduling. All delivery conveyors pass directly over

11. First machining operation on crankshaft line. Crankshafts are fed to operator from vendor's pallet at left. Operator loads machine and crankshaft progresses automatically through the mill.

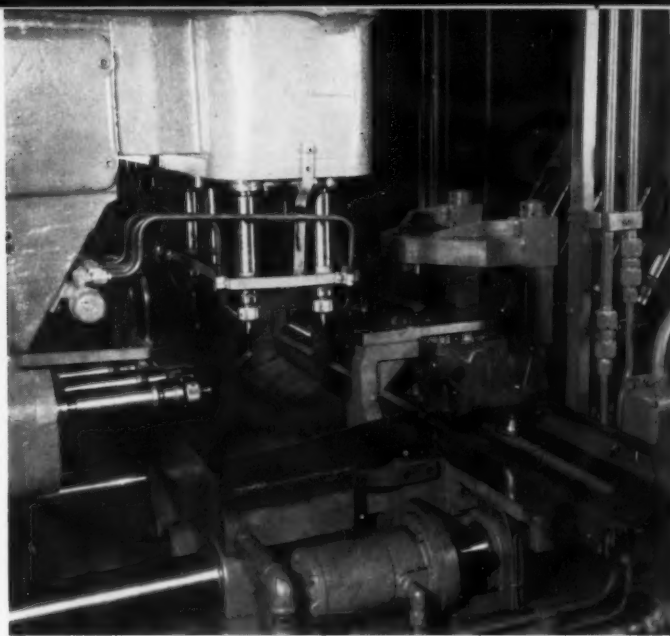


12. Hand loading crankshafts onto fixture for drilling operation. Eight oil holes are drilled at one time.





13. In this machine, holes are drilled for bolts, spark plugs, push rods, valve covers, water system, etc.—also spotfacing, milling, countersinking, core drilling, boring and reaming.



14. At 6th station of 18-station transfer machine, 24 taps mounted on left and right-hand horizontal and vertical spindles, thread various holes in cylinder heads.

the assembly line and small parts are stocked in eyelevel shelves over the line, thus the assembly operator has all his stock within his work area. Multiple socket power tools are used wherever adaptable. An automatic fogging machine oils the rod bearings and cylinder bores.

After assembly of the crankshaft, flywheel, camshaft, galley plugs, main bearings, connecting rod bearings, pistons, connecting rods, oil pump, damper, timing gears, timing chain,

and oil pan, the engine is rotated 180°.

This enables easier assembly of valves, tappets, cylinder heads, etc. When assembly is completed the engines are picked up by a power and free conveyor on which they receive final dress-up operations.

Completed Packard engines are delivered to a rotary test stand on a power and free conveyor. The engines are connected to the individual test stands, but remain suspended

from the overhead conveyor while the test stand rotates clockwise. Indications of engine performance on each test panel enable engines to be indexed for balancing or repair. When testing is completed the engines are detached from the test stand and are picked up by the overhead power conveyor which delivers them to the final balancing of repair areas.

After repair and/or balancing, the engines are ready for shipment.

15. In 4-station vertical trunnion machine, the camshafts are automatically centered, drilled, countersunk, counterbored and tapped—then a keyway is milled.



16. A multiple-wheel grinder finish-grinds five bearings on the camshaft in one operation.

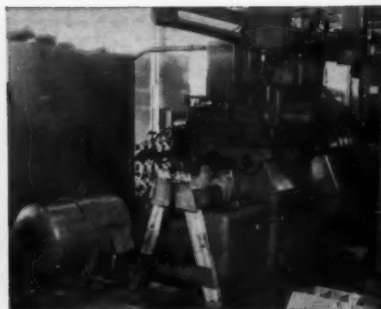


*To achieve the
high standard of its slogan
"PACKARD BUILDS QUALITY ONLY"
Packard must BUY quality only*

New Series
totally enclosed
fan-cooled motor



HOWELL ELECTRIC MOTORS
have been a **PACKARD CHOICE** for over 20 years



The Excello Diamond Bore unit and Wickes lathe shown here are two of many important Howell motor applications at Packard. Packard builds quality with quality equipment.

HOWELL ELECTRIC MOTORS COMPANY, HOWELL, MICHIGAN
Precision-Built Motors for Industry Since 1915



HOWELL MOTORS

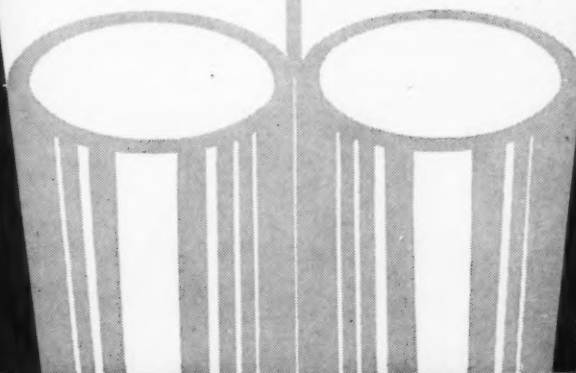
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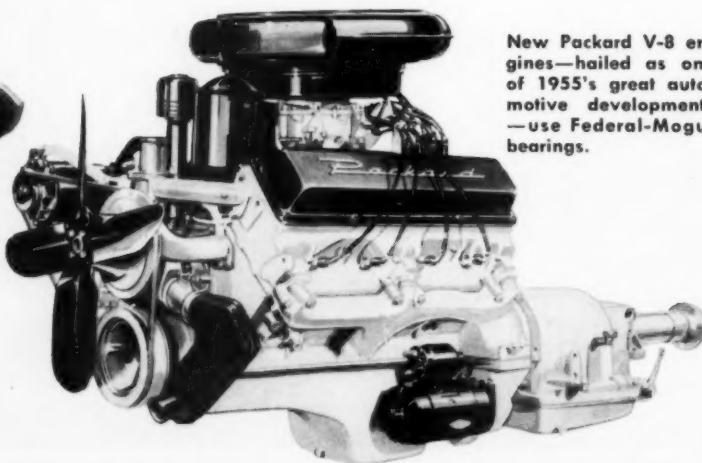
Hats are off to Packard Power!

Newest sensation of the automotive industry is Packard's new V-8 series engines. Up to 275 smooth, flowing horsepower achieves brilliant performance through the entire range of Packard V-8 powered cars. Packard V-8s are equipped throughout with Federal-Mogul connecting rod and main bearings. We are proud to have been a Packard supplier since 1916.

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Detroit 13, Michigan

Since 1899



New Packard V-8 engines—hailed as one of 1955's great automotive developments—use Federal-Mogul bearings.



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ALLIED PRODUCTS CORPORATION

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Produced in
**ALLIED'S FIVE
OTHER PLANTS**

SPECIAL COLD FORGED PARTS; STANDARD HEXAGON HEAD CAP SCREWS; PRECISION HARDENED AND GROUND PARTS; SHEET METAL DIES PRODUCED IN ALLITE (ZINC ALLOY) AND PLASTIC; R-B INTERCHANGEABLE PUNCHES AND DIES; POWDERED METAL PARTS



Operations near the end of the final assembly line at the Conner plant include testing of lights, filling the radiator with anti-freeze, etc. Note conveyor on right carries hoods. Further back on same side another conveyor delivers bumpers. Seat installation is from conveyor on left.

Car production in the new Conner plant

a quality control system has central correlation of information from 237 stations

P-30

FEBRUARY • 1955 finish



When the new Packards and 1955 model Clippers were introduced to the public in January, more than just a new product

tooling story was involved. Behind the scenes, a complete manufacturing facilities changeover and modernization program were carried out, completing a job in 60 days that experts said couldn't be done in a year.

The multi-million dollar program to take the car building out of 50-year-old plants and put it into a modern single-story plant was completed November 17 when 1955 models began to roll off the lines.

The facility expansion program was the first carried out by any of the smaller companies since World War II. It was one phase in the program, launched two years ago to regain Packard's position in the luxury car field.

In addition to construction of the new V-8 engine and transmission plant at Utica, Michigan, the key to modernization plans was a new facility to house all body and final car assembly activities. As the solution, Packard acquired a plant on Detroit's east side which studies indicated could be adapted to Packard car assembly requirements.

Nance wanted this assembly plant

to be "a compact, integrated machine, geared to our expected volumes — the latest in automation."

On July 1 last year, the company took over the plant where a supplier had produced Packard bodies. The last 1954 body came off the lines September 16, and immediately work began to move all car building into this plant. By combining body building, sub-assembly and assembly lines under a single roof, "for the first time in the industry," the building would provide maximum control of volume, greatest flexibility and ease of quality control, lowest unit manufacturing costs. Two months later on November 17, this project was completed.

In bringing this plant into production, the entire inside of the building was cleared out with the exception of the paint ovens. New assembly lines, automatic equipment, and mechanized materials handling devices were installed. The entire overhead rigging was pulled down from the ceiling. Nearly 50 miles of piping were rerouted. Four miles of conveyors were planned. Not a single light in the plant is in the same place today as it was in September last year.

The result:

1. In one million square feet on one floor, Packard will carry out car building operations which occupied three million square feet on five floors in the old plants.

2. There will be a marked reduction in costs through materials handling, automation, improved methods and lower maintenance costs.

3. Almost all operations will be handled by conveyors and automatic machines. Specific processes will be from 50 to 100 per cent more automatic than in prewar-type plants.

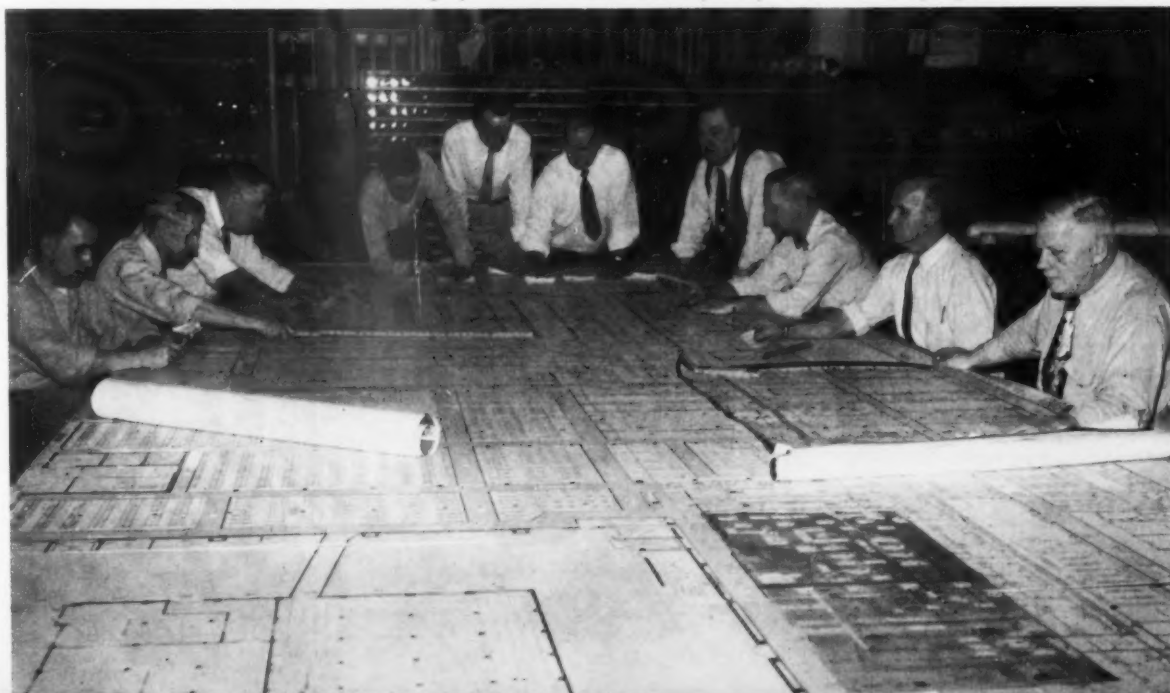
4. For the first time in the industry, final assembly, repair, final paint and shipping lines are parallel allowing quality control experts to step across lines to trace any trouble immediately to its source.

5. Many new manufacturing innovations in plant layout and procedures were instituted, such as the location of the water test in the final assembly line before interior door panel trim is installed.

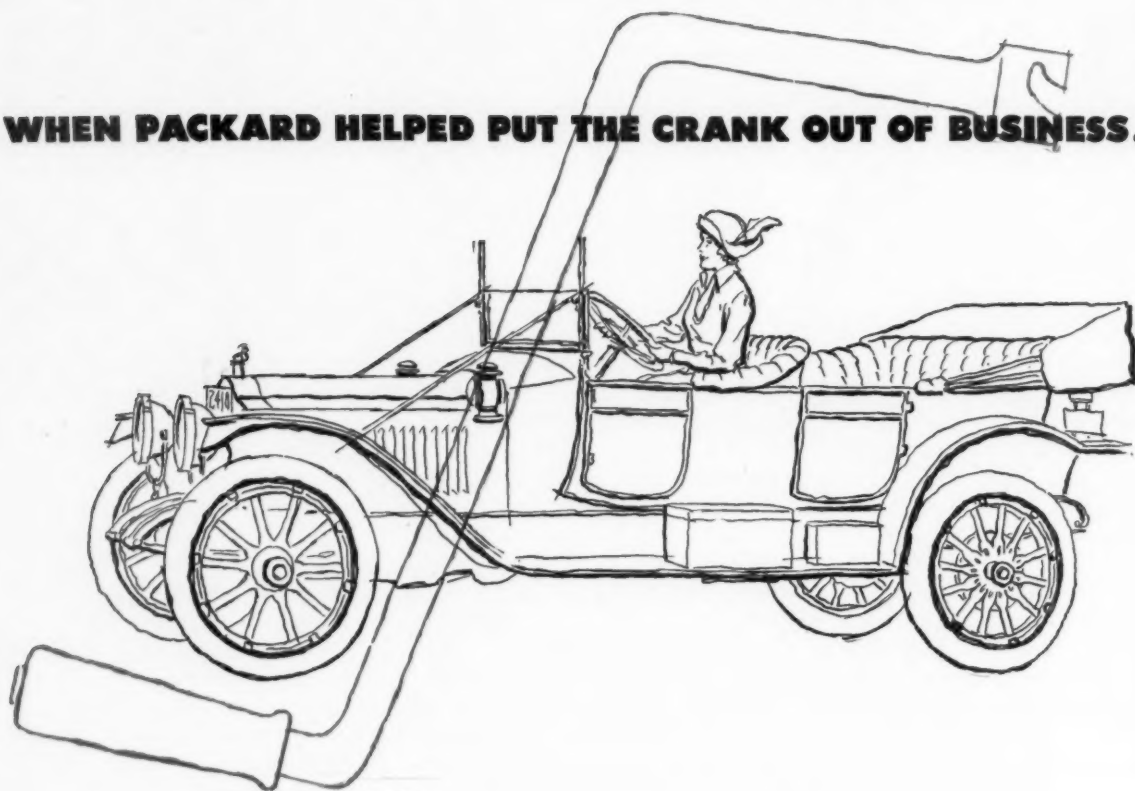
6. A new inventory control and sub-assembly scheduling system using teletype and two-way radio was established. Lead time on incoming primary "A" items is only three days. Larger departments such as welding and painting work on a daily schedule, usually several hours ahead of final assembly, smaller sub-assembly departments such as interior door trim only an hour or less ahead of final assembly.

7. A quality control system with central correlation of information from 237 stations along the lines is new to the industry.

Key to bringing the Conner and Utica plants into production in a short time was the detailed advanced planning and modern plant layout techniques employed. The new procedures were instituted for the first time at Packard with the launching of its multi-million dollar facility modernization program.



WHEN PACKARD HELPED PUT THE CRANK OUT OF BUSINESS...



**Willard put strong-arm power
into gentle hands!**

Two years before the electric starter was first offered the motoring public in a car, T. A. Willard, founder of The Willard Storage Battery Company, was cooperating in its development. In 1912, when Packard first featured electric starting, a Willard Battery put strong-arm power into gentle hands . . . permitted even the ladies to start the powerful Packard engine. And today, an infinitely more powerful 12-volt Willard provides quick, dependable starting in the all-new Packard for 1955.

In its first 50 years, Willard pioneered more "Firsts" in batteries than any other manufacturer. And the respect for Willard quality shared by so many engineers is reflected in this fact: Year after year Willard Batteries have been used as original equipment by more manufacturers than any other make . . . and will again in 1955.

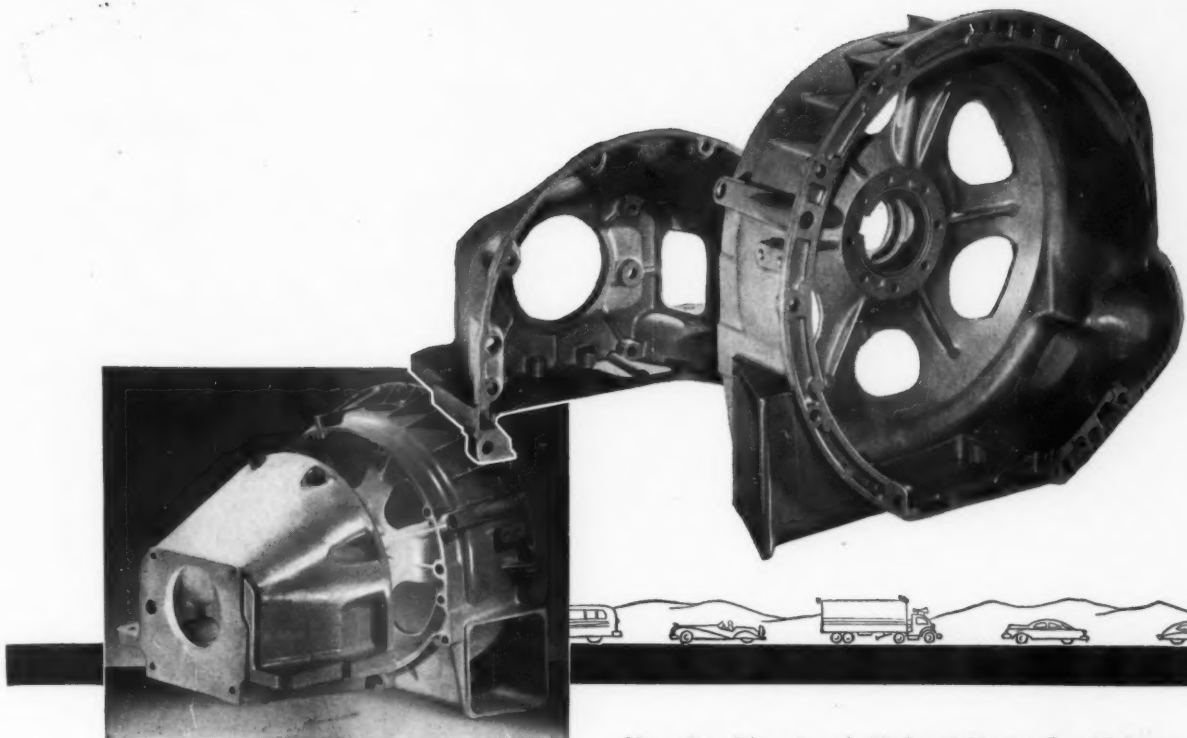


This new 12-volt Willard Deluxe is standard equipment in the brilliant new Packard for 1955. This popular-priced battery, with exclusive Metalex grids, offers greater starting power at zero, and unexcelled protection against overcharging—the No. 1 battery killer.

Willard

America's top-quality battery for over fifty years

Cleveland • Los Angeles • Dallas • Memphis • Portland • Allentown • Toronto



These torque converter and clutch housings are light, sound and strong. They withstand great vibrational stresses and the jarring and jouncing encountered in endless miles of "shift-free" motoring. As cast by Doehler-Jarvis, these housings provide many economies in machining costs. For one example, the long oil holes in the torque converter housing are cast-in.

How Doehler-Jarvis Helped Motor Car Makers

halve the weight and lower the cost of heavy duty housings

YOUR MOTOR car dollar buys a whale of a lot more performance than it did a few short years ago. Why? Because it pays for less dead weight and more useful horsepower. It pays for fewer heavy, slow-production parts and buys more lightweight, high-speed, precision-made units. It pays for fewer laborious fabrication steps and buys more streamlined assemblies of formed-to-fit parts.

As a case in point, consider the automatic transmission. It has become progressively more efficient, lighter in weight, part for part—and less expensive to own and operate.

These improvements have been made possible to a great extent by the use of die cast parts, many of which are produced by Doehler-Jarvis in close cooperation with motor car makers.

A prime example of this teamwork between the customer's design and engineering staffs

and those of Doehler-Jarvis is the set of housings—torque converter and clutch—illustrated.

These are truly heavy duty parts. Before Doehler-Jarvis entered the picture they weighed together about 50 pounds and required considerable working-over and machining prior to assembly. The Doehler-Jarvis aluminum housings weigh about 23 pounds and require a minimum of handling before assembly.

This is but one example of how the Doehler-Jarvis organization, with resources and resourcefulness developed during a half century of die casting, works hand-in-hand with makers of metal products—in the automotive, household appliance, office machine, electrical merchandise and many other important industries.

Call in Doehler-Jarvis when you are faced with problems in the design and procurement of lighter weight, lower cost, more efficient metal parts.

Doehler-Jarvis Division

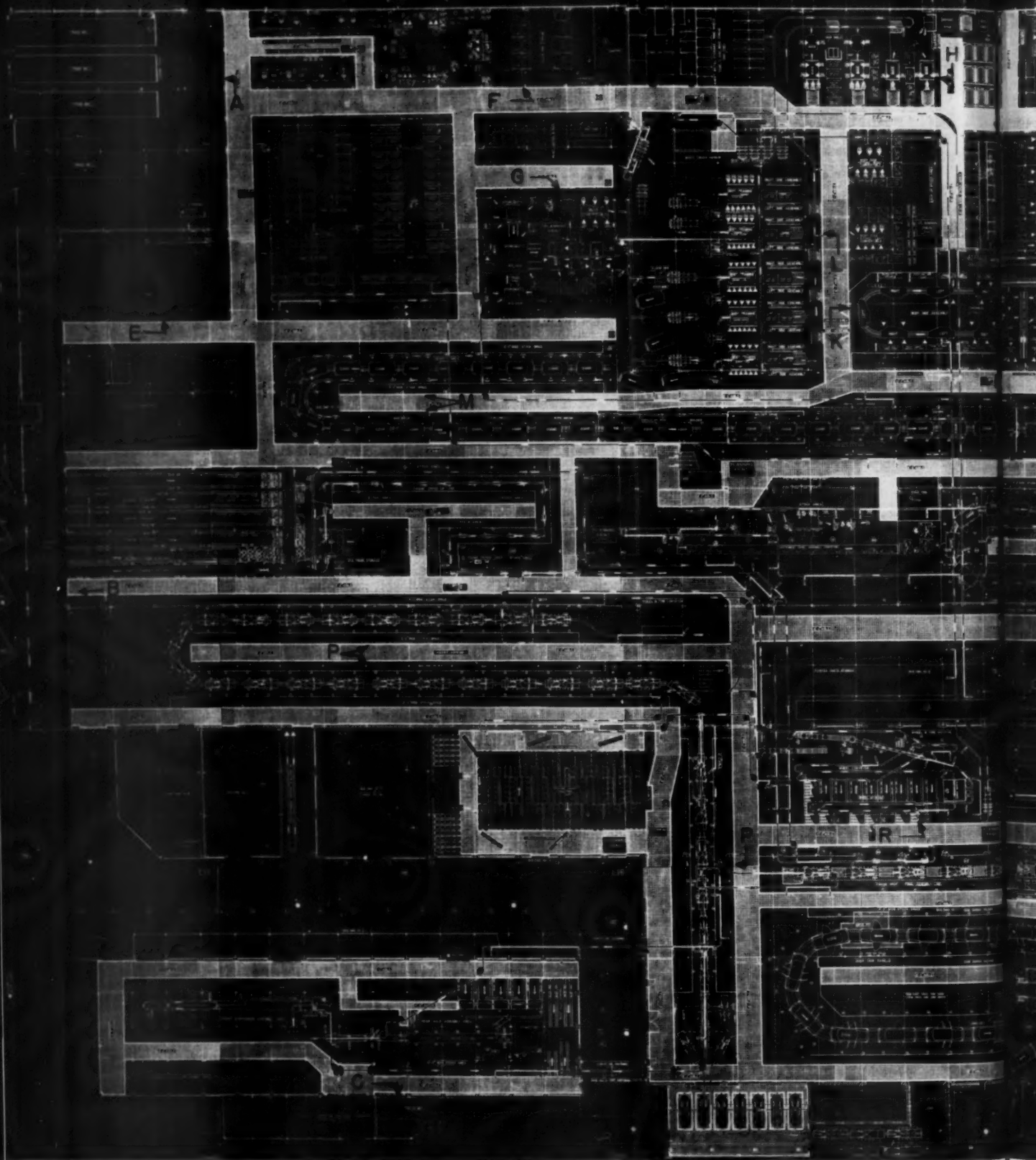
of

National Lead Company

General Offices Toledo 1, Ohio



*Reg. U.S. Pat. Off.

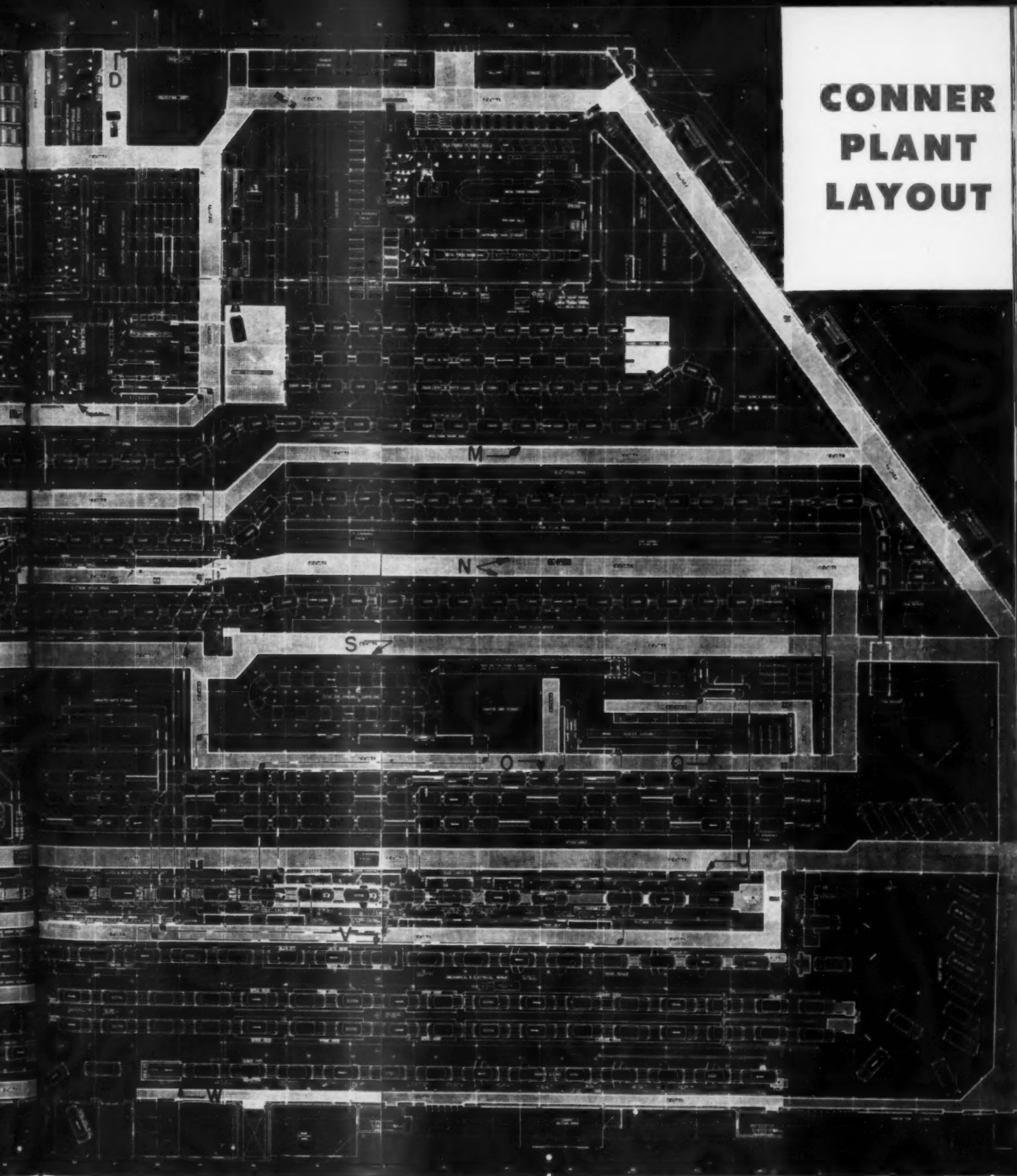


A — Receiving for doors, trunk lids, floor pans & small sheet metal parts
B — Receiving for engines, transmissions, chassis parts, trim material, engine components, tires, wheels & bumpers.

C — Receiving for front suspension & rear axle parts.
D — Receiving for hoods, fenders & body parts.

E — Welding Seat Assemblies
F — "Miscellaneous" Welding Area
G — Under-body Assembly
H — Roof Sub-Assembly
I — Gas Tank and Wheel House Assembly

CONNER PLANT LAYOUT



J — Quarter Panel "Merry-go-round"
 K — Body Side Assembly "Merry-go-round"
 L — Final Framing Bucks
 M — Final Welding and Metal Finish Line

N — Trim Section (Assembly)
 O — Body Bank
 P — Frame Assembly
 Q — Bumper Sub-Assembly
 R — Tire Sub-Assembly
 S — Front End Sub-Assembly

T — Assembly Line Body Drop
 U — General Quality Control Inspection
 V — Car Wash and Leak Test
 W — Final Inspection
 X — Drive Away

Note: General quality control inspections occur throughout the plant; however, the one indicated as U is the first on the car "ready to drive."

for transportation equipment
that stands up...



FLAT-ROLLED STEEL

produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them to improve products and reduce costs. We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

Great Lakes Steel

Ecorse, Detroit 29, Michigan

PRODUCER OF N-A-K HIGH-TENSILE STEEL



UNIT OF
NATIONAL STEEL CORPORATION

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA

Congratulations Packard on going **MODERN** with

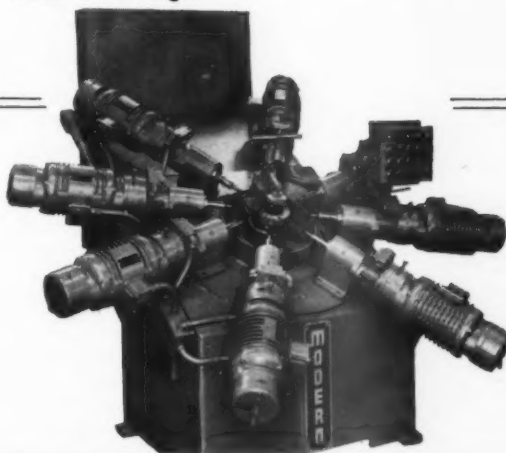
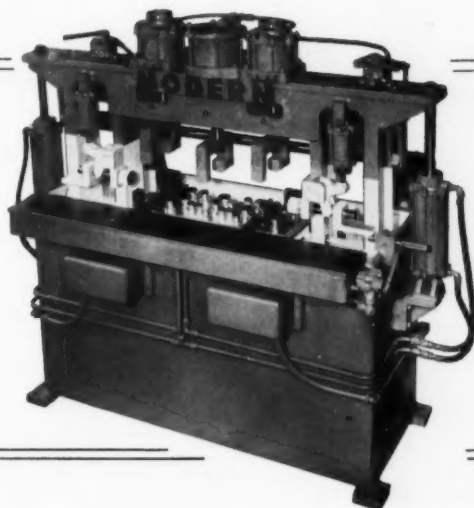


MODERN *Burr-Masters*

for chamfering and deburring the entire tooth form of spur and helical gears as well as straight or involute form splines.

MODERN Pressure Testing Machines

for porosity testing of cylinder heads. This equipment is used not only for porosity checking but also locates leaks for salvage.



MODERN Multiple Drilling Equipment

for rapid multiple drilling of "smoke" holes in automotive pistons. Eight stations work simultaneously.

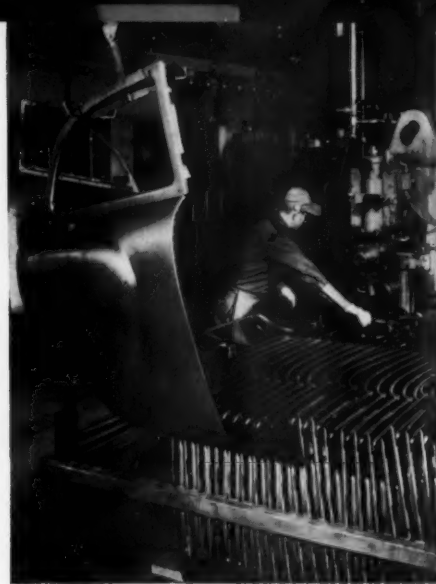
MODERN

Industrial Engineering Co.

14230 BIRWOOD AVE. DETROIT 38, MICHIGAN



Sheet Steel is fed into a blanking press and sheared to fender outline.



Smoothly Contoured door panels, each shaped from a sheet of steel, move steadily on conveyors.



Eight-a-Minute—Steel sheets are deep drawn to fender contours in this huge, 450-ton double acting ram press where the cold steel flows evenly under tremendous pressure.

Shapeliness

The New GiveDe

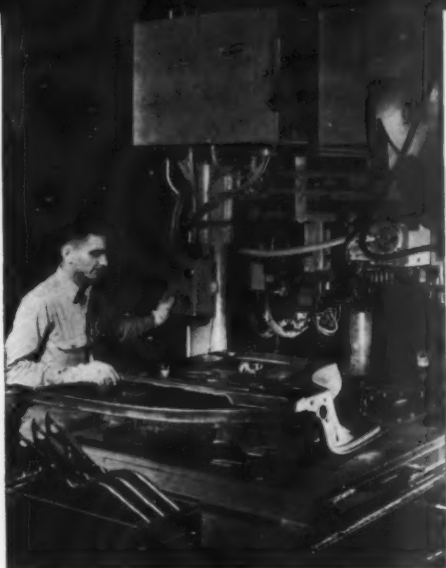
When you look at the low, smooth-flowing lines of today's automobiles and admire their graceful styling, do you ever wonder how steel becomes so shapely?

The appeal of an automobile's design is far more than just the dream of a designer worked out from the artistic sketches and mock-up models he creates. It is the translation of his clay models by engineers and production men into practical contoured curves of steel sheet.

In the early days, the designer was limited by what steel could do and restricted by his own production equipment.

Today, automation has improved and speeded production. The techniques for making steel have advanced apace. Automakers can draw on the resources of technical know-how and steelmaking facilities equipped with the latest in technological controls, such as the new rolling mills at Pittsburgh Steel Company, for producing hot and cold rolled steel sheet.

So today the designer's range of ideas is becoming increasingly unlimited because better production and new quality in steel are giving



Complex Automatic equipment assembles inner and outer door panel where automation speeds production.



Assembled Doors, solidly constructed, yet gracefully styled, are ground and polished for perfect surface.

evFashion In Steel Quality veDesigners Vast Horizons

him ever-widening horizons for the creation of practical new designs. At Pittsburgh Steel this new quality in steel is called shapeliness.

• **What Is It?**—Shapeliness is the ability of steel to be drawn under tremendous pressure to the severest contours of design, while retaining its strength and giving a consistently smooth surface. Beyond that, it must maintain this quality uniformly in sheet after sheet and coil after coil to provide smooth, trouble-free performance on high-speed production lines.

You can quickly grasp the importance of this quality by taking a look at production in the modern plant of Jarecki Corporation, Grand Rapids, Michigan, where fenders and doors are shaped (see photos) for the beautiful new Packard.

The sheet from Pittsburgh Steel to provide these shapes has the necessary internal qualities: exact chemical analysis, cleanliness, and fine grain size. And it has the most desired external qualities: uniform dimensional accuracy and surface cleanliness.

It must have these qualifications

throughout each sheet and from sheet to sheet as it is fed into powerful, high-speed press operations in order to minimize the possibility of grainy surface, buckles, wrinkles, tears, stretcher strains, or skin breaks.

It is shapeliness, then, that assures a snug-fitting door or fender with a clean, smooth surface for painting . . . one that is attractive on the showroom floor and a stand-out on the road.

• **How It Pays**—Not every steel-maker can produce this quality of shapeliness in steel with the same success. Some, by reason of new equipment and technical experience,

can meet the manufacturers' requirements more consistently than others.

If the production of your products requires better than average quality sheet steel, why not explore the opportunities Pittsburgh Steel offers you? Your orders will get personal attention from the time they are entered on the books until your product is completed. A phone call to the district office nearest you may prove worthwhile today.



In the Showroom and on the road, designer's creation becomes a beautifully practical reality of steel shapeliness.

"Everything New But The Name"

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Atlanta • Chicago • Cleveland • Columbus • Dallas • Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Tulsa • Warren, Ohio. **PLANTS:** Monessen, Pa. • Allenport, Pa. • Akron • Los Angeles • Unionville, Conn. • Warren, Ohio • Worcester, Mass.



Write for your copy of the color brochure "The New Pittsburgh Steel Company."



Packard wheels are received in large unit loads, and stored on roll-type conveyors at point of usage. Wooden handling pallets are returned to the vendors for re-use.



MATERIALS

UP-to-the-minute production scheduling calls for speedy and direct materials handling — from receipt of raw material to delivery of sub-assemblies to the final assembly line.

Currently, 125 truckloads of material are received on an average day. So that this incoming material won't have to be moved too far from receiving dock to the different production departments, Packard utilizes four separate receiving areas at the Conner plant, including four truck dock areas with adjustable loading ramps in each of 14 truck docks.

Large sheet metal parts, such as car roofs and fenders, are received in tubular steel racks. One type of rack can accommodate 17 roofs while another can handle 12-14 fenders.

Other parts are received in expendable cartons and wooden pallets. Engines (made at the Utica plant) are delivered to the Conner plant in 34-foot "roller bed" trucks. Each truck can handle 12 tubular steel racks with four engines to a rack.

Frames are delivered to the plant yard by gondola car — with 112

Center: Final assembly line near the "body drop" area shows a series of overhead monorail "feeder" conveyors serving the line.

The tubular and angle steel trucks on which the bodies ride are designed to prevent dislocation. The bodies continue from welding bucks through all final body fabrication and finishing to a point near the assembly line body drop on these trucks.

Front fenders present a handling problem due to their irregular shape. Here tubular steel racks of fenders are shown as received from vendor. Racks are tiered 3 to 4 high in storage.

HANDLING

frames to a car. A portable yard crane unloads the cars and stacks the frames. The crane is also used to load the frames on a wheeled dolly (holding five frames), and tug-type industrial trucks deliver the frames to an enclosed storage area at the head of the chassis assembly line. Here a hoist on an overhead conveyor delivers the frames to the assembly line.

The rear axle and front suspension, built up complete in a nearby building, are brought to the chassis assembly line by an overhead conveyor.

Springs and pads for seats are loaded on an overhead tray-type conveyor at the receiving dock. This conveyor then carries these parts to the seat assembly department.

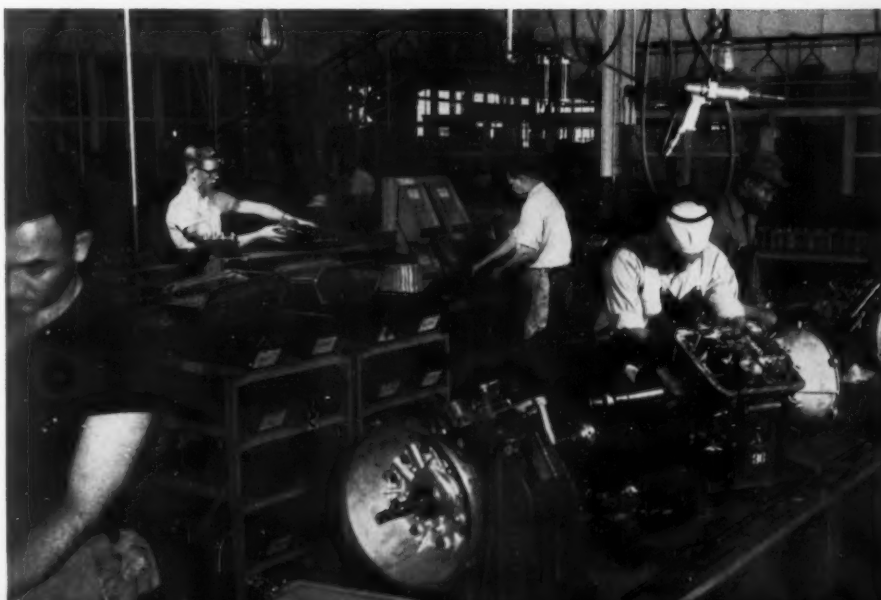
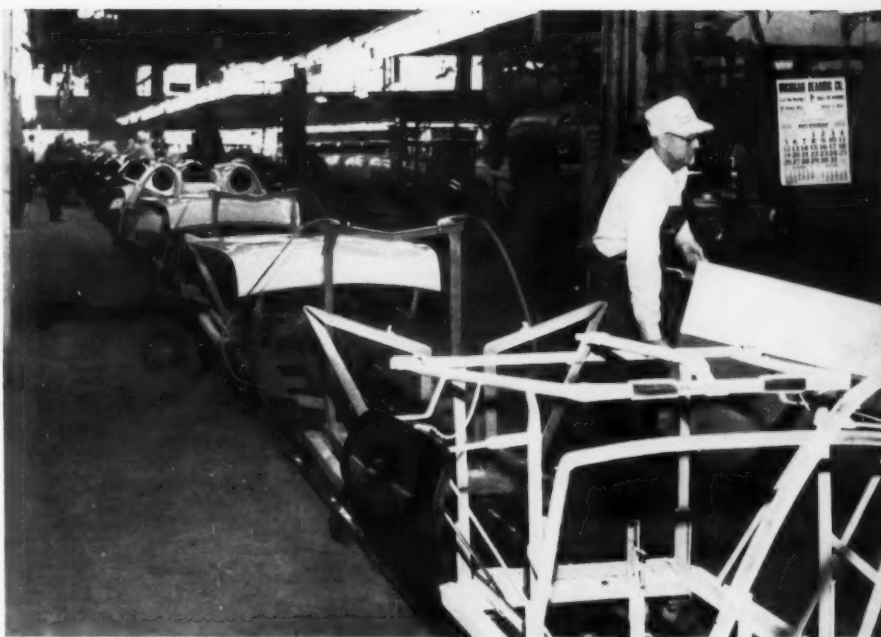
Altogether there are over 4 miles of conveyors of all types used in the Conner plant.

In addition, there are 40 gas and electric trucks (both fork and tug-type) used to speed incoming material to the production departments. Many of these trucks are equipped with 2-way radios.

Center: This type of truck is used to support miscellaneous parts such as front fenders, hoods, etc. through paint finishing operations.

In Utica engine plant, extensive use is made of conveyors, steel parts baskets, special hoppers for utilizing original cartons, and other material handling equipment. The air-conditioned area shown here is a along the transmission assembly line.

finish FEBRUARY • 1955





PACKARD PISTON RACK

Controlled Parts Storage *System by* **BATHEY**



- Bathey controlled parts storage system prevents inventory losses.
- Bathey controlled parts storage system speeds up small assembly operations.
- Bathey controlled parts storage system can be rearranged with ease to meet production requirements.
- Bathey has complete facilities for fabrication of railroad equipment plus a complete line of TOTE PANS . . . BIN BOXES . . . RACKS . . . DOLLIES . . . SKIDS . . . PALLETS.



BATHEY IS PROUD TO BE PART OF INDUSTRY'S PRESENT DAY MODERNIZATION PROGRAM . . .

We invite YOUR inquiry on custom designed equipment as well as our standard parts storage and handling equipment.

Because of its flexibility many of the country's larger corporations have standardized on BATHEY equipment on a plant wide basis.

Write Special Products Division for complete information on stampings, parts and production runs



BATHEY MANUFACTURING CO.

100 SOUTH MILL ST.

PLYMOUTH, MICHIGAN

JARECKI

Packard production partner



We, at Jarecki, are proud of the part we were able to play in the production of the beautiful new Packard. Our job started with die design and continues with volume production to finished fenders and doors. All of our customers have a choice of any combination of these facilities for working sheet metal:

DIE DESIGN	WELDING
DRAW DIE DEVELOPMENTS	PHOSPHATE COATING
DIE CONSTRUCTION	FLOW COAT, SPRAY
COMPLETE DIE TRYOUT	PAINTING & BAKING
STAMPINGS	QUALITY CONTROL
PRODUCTION ASSEMBLY	PACKAGING
PROMPT DELIVERY	

Write for our Facilities Booklet

JARECKI CORPORATION

DIES • STAMPING • ASSEMBLIES • PAINTING

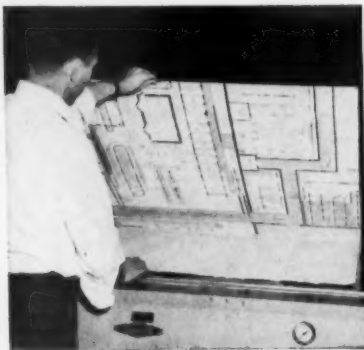
GRAND RAPIDS 2, MICHIGAN



1. PACKARD MAKES FLOOR PLANS by outlining permanent plant features with gummed tapes or inked lines on specially white-surfaced aluminum plates printed with a $\frac{1}{4}$ " grid. These light, accurately squared, and easily handled plates can be butted together to represent any large area.



2. POSITIONING OF SCALED PLASTIC TEMPLATES and pre-printed tapes representing machine tools, conveyors, benches, aisles, etc., is the next step. Templates are reproduced in multiples on sensitized plastic by photocopy from a drawn original. Double-sided adhesive tape allows movement of templates and rearrangement at any time.



3. NO COSTLY TRACING OR DRAFTING.

As the layout progresses, photocopies of each completed plate are made quickly and easily on a Peerless vacuum-bed printer. From these, any number of vellum positive reproductions can be made in exactly the same way. Millwrights work directly from blueprints made from these copies when installing machines and equipment.

Packard's plant layout procedure cuts drafting hours and saves \$\$

PEERLESS PHOTOCOPY SYSTEM SLASHES LAYOUT PLANNING COSTS

Originally developed by our Detroit distributor, Industrial Photo Products Co., this modern plant layout system has been installed in many mass production plants in the automotive capitol.

It is now available on a national basis through Peerless Photo Products, Inc. and its distributors, who can supply all equipment and materials used in the procedure.



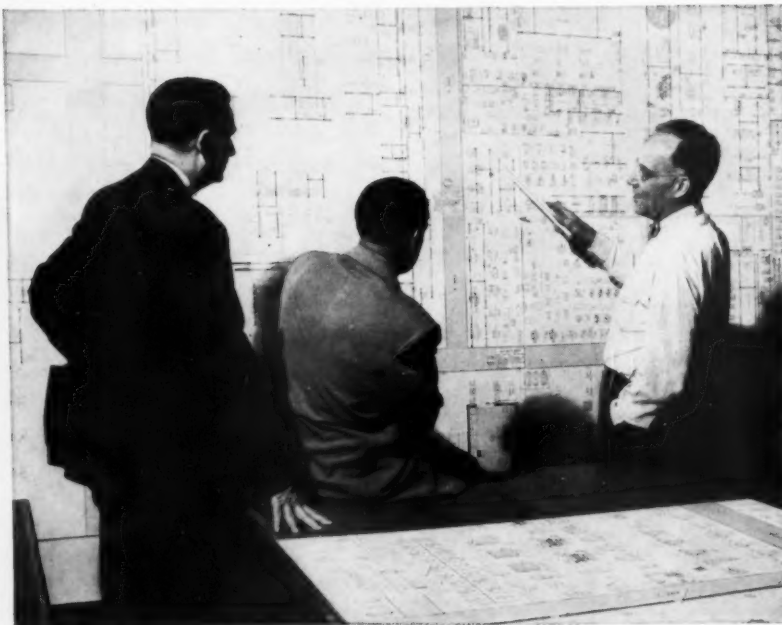
for complete and expert advice, please write us.

Send today for free leaflet MODERN PLANT LAYOUT.

PEERLESS PHOTO PRODUCTS, INC.

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Distributors in: Los Angeles • Chicago • Cleveland • Detroit • Pittsburgh • Buffalo • Tulsa • Dallas • Houston • Salt Lake City • Atlanta



4. FOR CONFERENCE AND REFERENCE, Peerless layout plates are hung on walls or laid out on large tables so that engineers can view the whole plant area at once. When revisions are required, photocopy reproduction replaces slow, expensive drafting.

F A B R I C A T I O N

Packard front fenders being drawn in large press in the vendor plant.



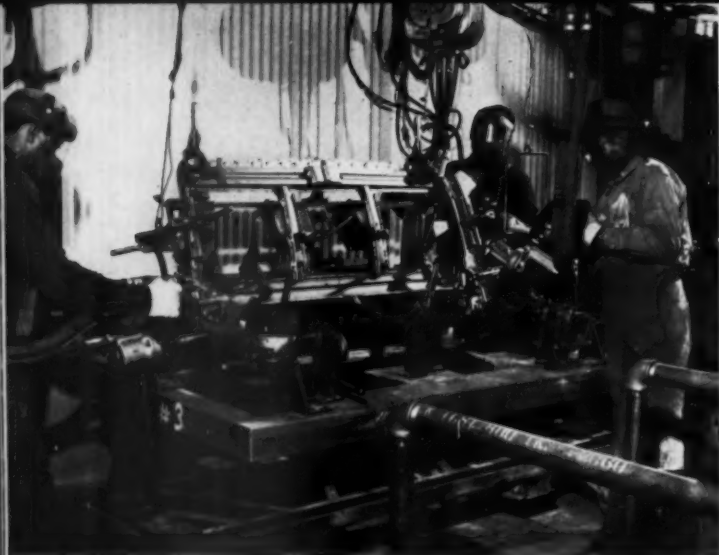
PACKARD body fabrication is concentrated in a group of 7 major sub-assembly areas which feed their welded sub-assemblies and components to a series of 5 framing bucks for the completion of the body structure.

As we start our trip through this section of the plant with chief layout man, Bob Rienecke, cameraman, and notebook, we cover each main sub-assembly section leading to the final framing bucks.

Selecting the Packard front seat

for following operations we find 2 hydromatic presses: (a) welding the lower-back seat (44 spots), and (b) welding front reinforcement.

Approximately 10 component stampings are assembled to complete the seat. Smaller components are



Components for the Packard front seat are placed in this fixture for final welding of the seat assembly.



One of the many stations in the "miscellaneous" area. These operators are performing work on the rear floor pan extension.

Three automatic press welders located in line for producing the under-body assembly. Welders in left foreground (rear floor sub-assembly) and right background (front floor sub-assembly) feed to center unit where front and rear assemblies are joined into 15-foot reinforced under-body for the 4-door Clipper.



fabricated in individual fixtures and welded with portable guns and stationary spot welders.

All components are placed in a special seat welding fixture served by 6—75 KVA welders.

"Miscellaneous" welding area

Our next stop is at an area where all of the miscellaneous components which do not fit into the 6 other sub-assembly stations are fabricated.

Among the scores of operations handled here we find: drilling operations on garnish mouldings, clinch nut operations on rear floor extension pans, production of gas tank pocket and folding arm rests, welding battery boxes, sub-assembly of rear floor pan extension and sub-assembly of the radiator cradle.

These are only a few of the many operations and parts produced or sub-assembled, so it will be evident that the area is equipped with a variety of small machines, welding equipment and special tools and fixtures.

Under-body assembly

Now we arrive at a station where more massive equipment is required. There are three large automatic press welders located in line to complete the under-body.

We view the operations on the under-body assembly for the 4-door Clipper.

Welder No. 1 — The rear floor, tire well and gas tank reinforcing straps are loaded and 56 spot welds are completed in a single hit. This unit has 14 transformers, 55 KVA each.

Welder No. 2 — At the opposite end of the station the front floor pan sub-assembly is loaded including: 4 cross bar members, seat track reinforcement and front and rear sections of front seat pan. Two hits produce 180 spots. This unit has 32, 55 KVA transformers.

Welder No. 3 — The front and rear floor sub-assemblies now feed to the third welder located in the line midway between these two units.

Reinforcements are added and the 60 spots produced in one hit to complete the 14 ft. under-body. Welder No. 3 also has 32, 55 KVA transformers.

Roof sub-assembly

At our next stop we see a roof for the 4 door Clipper being removed from one of the large portable racks in which they are transported from the stamping source.

The roof gets a careful inspection for metal finish and is then loaded into a welding fixture in an inverted position.

Drip mouldings and upper back light re-inforcement are now welded.

A sound deadener pad is applied, and the roof is then transferred to an overhead conveyor for delivery to the framing bucks.

Gas tank and wheel house assembly

To produce the *wheel house assembly*, inner and outer wheel house panels are joined on 2 — 100 KVA roll spot welders operating at 16 ft. per minute.

Gun welders then add miscellaneous brackets, and the completed parts feed to the framing department.

First operation on the *gas tank* is to solder the gas line into the upper half of the tank followed by projections welding the float ring. By slat conveyor the upper and lower sections travel to a spot welder for tacking and then to a seam welder for joining the upper and lower halves.

A filler pipe is then soldered in, and the tank travels by roller conveyor to an underwater pressure test (14 lb.).

Float gauge is added on another roller conveyor, and tanks then go to a storage and delivery conveyor.

Quarter panels

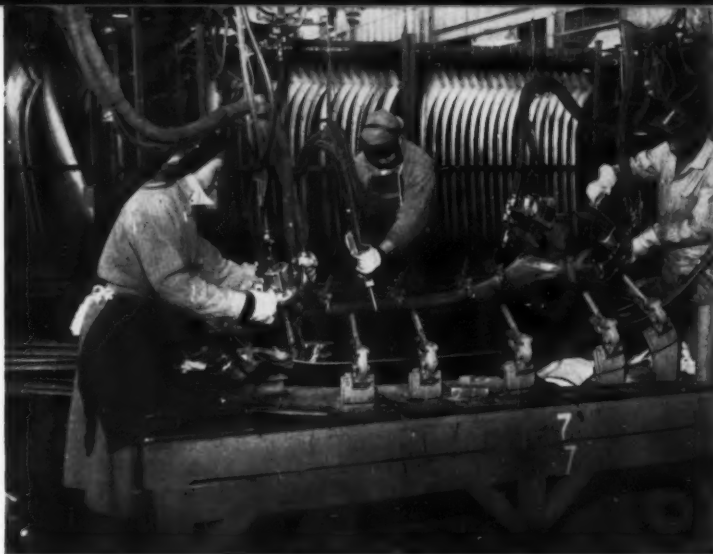
Now we arrive at a concentration of operations conducted in a series of eight fixtures located on a conveyor "merry-go-round". Four of the fixtures are for left hand and four for right hand quarter panels.

After the upper and lower quarter panels are loaded into the fixture, and clamps set, the two are joined by welding. Portable 50 KVA gun welding units (14) are carried on overhead conveyors to service the merry-go-round.

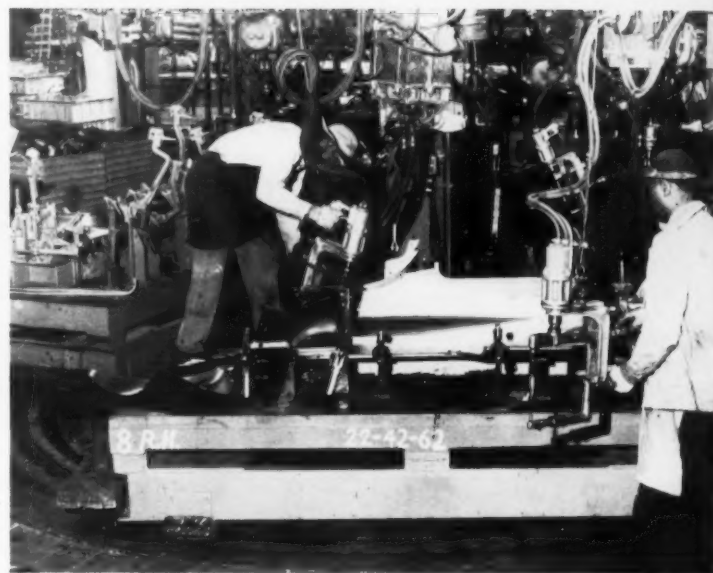
Next the lock pillar face and trunk drain trough are welded.

finish FEBRUARY • 1955

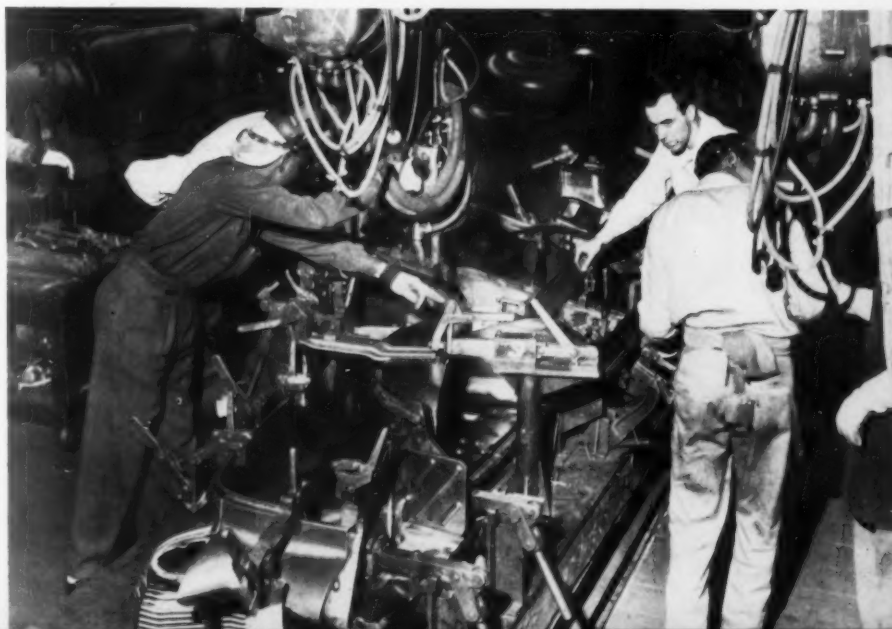
Welding the drip mouldings to roof sub-assembly for the 4-door Clipper. Storage and transport racks are visible in background.



A series of 8 fixtures on a merry-go-round with drag conveyor are used to complete quarter panel. Four of the fixtures are for left hand and four for right hand panels.



Except for two small parts, all components for the complete body side assembly are loaded onto this fixture car for welding. Operations are handled progressively as this car (one of 8 on a merry-go-round) is conveyed through eight stations. The area is served by twenty-two 50 KVA guns.





Close-up of one of the five framing bucks in which the complete body assemblies are tack welded into rigid one-piece units. The roof will be added to this structure before the body leaves the framing buck.

The quarter sections are now transferred to an adjacent 8-fixture merry-go-round for complete body side assembly.

Body side assembly

At this station we see all components for a complete body side assembly loaded onto the fixture at one point, except for 2 small parts.

Starting with the completed quarter panel assembly (loaded from preceding merry-go-round), the various components are added and welded at each of 8 stations. In turn come the center pillar, rocker panel "outer", front cowl assembly, roof rail "outer", wheel house and rear floor

pan extension (from "miscellaneous" area). 22, 50 KVA guns are used at this station.

An air cylinder chain hoist is used to unload the completed body side assembly from the merry-go-round at a point adjacent to the line of framing bucks.

Final framing operations

Now we come to the line of 5 framing bucks for completing the body assembly. They are for: (1) Clipper 4-door, (2) Clipper hardtop, (3) Packard 4-door, (4) Packard hardtop, and (5) Carribean. Stations 1 and 3 and 2 and 4 have interchangeable facilities for model pro-

duction. Each framing buck is equipped with 12—50 KVA gun welders.

On loading the framing bucks the major sub-assemblies are added in the following sequence: (1) underbody, (2) side assemblies, (3) upper and lower back panels, (4) windshield frame and dash panel, and (5) roof.

After framing in the buck all parts are tack welded to form a rigid one piece unit for handling.

The completed body frame is now removed from the buck and transferred to a "body truck" which will carry the unit through all subsequent welding, metal finishing, painting and other operations to the final "drop" on the assembly line.

The "truck" deserves more than a passing description, for it holds the responsibility for delivering a completely finished body to the assembly line, without distortion, from the time it is originally loaded at the framing bucks. Constructed of heavy tubing and angle iron, it is designed to properly support the body. Most of the travel is by floor type drag conveyor, but the truck has wheels for floor transfer at a few points between conveyors. The trucks also can be supported by self contained hooks from an overhead monorail (used for return to fabrication from assembly after leaving the body "drop").

Re-spot and gas welding and metal finish line

The completed bodies entering this
to Page P-62 →

On the re-spot and gas welding line, these men are gas welding joints at the rear end of the quarter panel, which must be structurally sound but are not applicable to arc or spot welding.



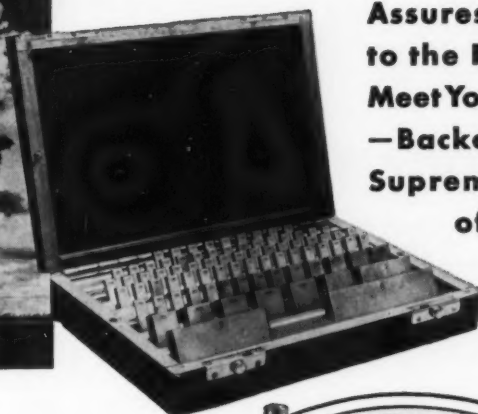
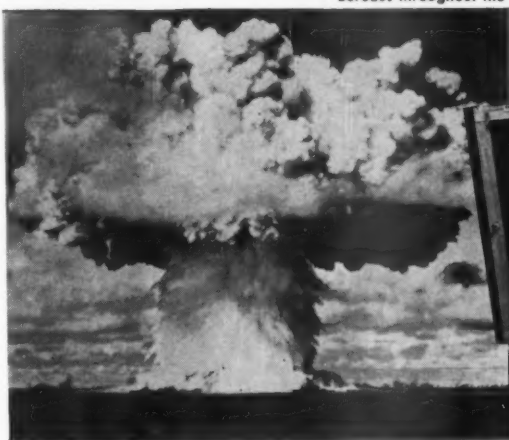
Forming operation for the Packard front fender. The fender is made in one piece in the vendor's stamping department.



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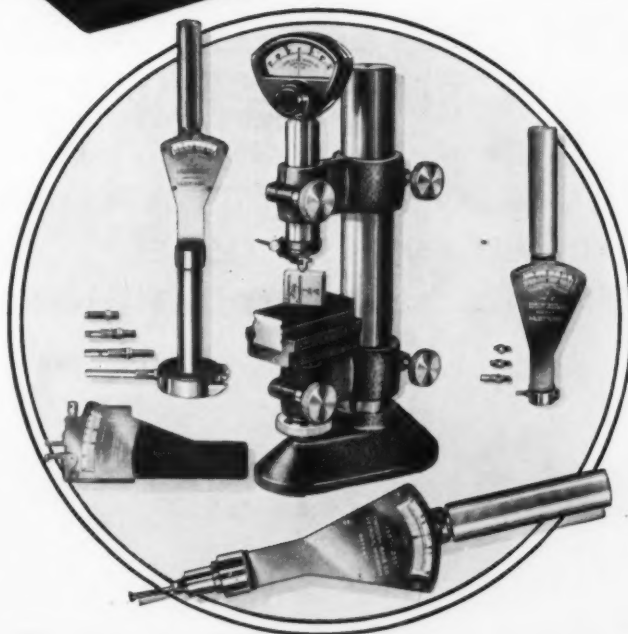
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P-49



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Luxurious 1955 Packard 400 Hardtop — product of Studebaker-Packard Corporation, Detroit, Michigan.

Packard parts begin life with a Wyandotte bath

In the production of the great new Packards for 1955, Wyandotte products are used in vital cleaning processes: **ALTREX*** for aluminum soak cleaning; **INDUSTRIAL D** in spray washers, to remove fabricating compounds and other soils from steel parts; **R-2** as an in-process rust inhibitor in spray rinses.

In fact, Packard has been using Wyandotte products for more than ten years — for more effective cleaning at lower use-cost. For in the manufacture of fine motorcars, quality is the foremost requirement — and cost is an important factor as well.

How about *your* business? Wyandotte offers the most complete line of metal cleaners in the industry: for burnishing and deburring; vat, steam-gun, washing-machine and emulsion cleaning; electrocleaning; rust removal; paint stripping; spray booths.

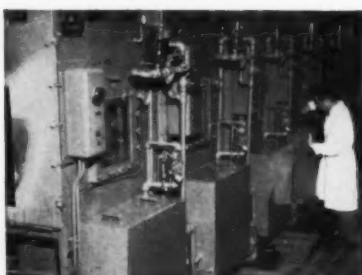
For technical assistance and data, call in your Wyandotte service representative, today. Or write us, c/o Dept. 2315, detailing your needs, along with specifications and requirements. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

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Call on Wyandotte to improve quality, cut costs



Packard uses Wyandotte cleaners in small soak tanks, to rid parts of cutting oil and soil; and in spray washes and spray rinses.



Wyandotte scientists can set up or duplicate any spray-washing cycle on this six-stage washer, to help solve your problems.

 **Wyandotte**
CHEMICALS
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Research-developed products
for metal cleaning

EACH metal finished body arrives in the second floor paint department on its individual truck via a drag conveyor and 1st to 2nd floor ramp.

Other sheet metal body parts such as fenders, hoods, fender shrouds and stone shields arrive via an overhead monorail conveyor.

system. Other conveyor transfers are made automatically).

Two 144 ft. spray cleaning and phosphatizing tunnels are in parallel

TANK CAPACITIES AND TEMPERATURES

1—2650 gal.	— Alkali Cleaner	— 150° F
2—2850 "	— Rinse	— 150° F
3—1680 "	— Phosphatizing	— 130° F
4—2080 "	— Rinse	— Cold
5—1070 "	— Chromic Acid	— 140° F

A liquid rubber sealer is then applied to all welded joints such as bulkheads, tail panels, tail lights and over and under drip rails. Body then enters prime booth.

Prime coat application (bodies)

Bodies enter a down draft tunnel type spray booth for the application

METAL PREPARATION — PAINTING

There is a completely separate cleaning and painting system for these two classes of parts. Processing of other miscellaneous parts will be described later.

Metal preparation

As the body reaches the head of the metal preparation line all exterior surfaces are hand cleaned with solvent cleaner, and then the car is manually transferred (about 8 ft.) to the drag conveyor feeding the cleaning and phosphatizing tunnel, (there is only one additional manual transfer point in the entire painting

locations for the body and sheet metal (miscellaneous parts lines). Processing in the tunnels is identical.

Parallel 80 ft. dryers follow. There are downdraft ovens employing overhead blowers with gas as the heat source. Drying is at 300° F.

Glazing and sealing bodies

A glazing line for bodies follows the cleaning and bonderizing. All soldered joints are glazed with knife blade glazing putty. Windshield posts and recesses at corners get a brush glaze. The material is applied to the "hot" body at it leaves the dryer.

of the "rust" color primer surfacer. Operators spray all accessible exterior and interior surfaces. The prime coat material is chosen for its stability and resistance to bleed under lacquer colors and for resistance to impact.

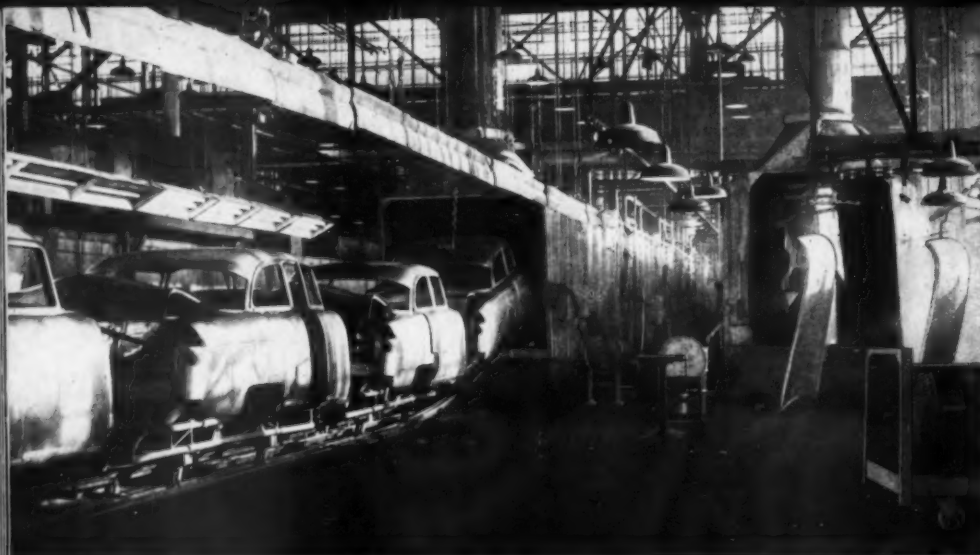
Bodies then pass through a vestibule for "flash off" of solvent and enter an oven for a bake at 285° F.

Immediately following prime coat baking, the bodies pass through a cold water shower for cooling and hardening.

The "shower" is followed by wet sanding of all exterior surfaces. Ma-



Following the baking of first lacquer coats, dust and moisture-proof paper is applied to finished "lower half body" and jams for masking prior to painting the "upper body".



Dual cleaning and phosphatizing lines prepare the white metal for painting. Tunnel at left is for bodies only (drag conveyor). All miscellaneous "sheet metal" goes through parallel tunnel at right (overhead monorail). Tanks range in capacity from 1070 gal. for chromic acid to 2850 gal. for rinse.

These bodies have just come from the cooling and hardening shower which follows the prime coat bake oven. Men in background are machine wet sanding the prime coat. Man in foreground wet sands, by hand, the surfaces not suited to machine sanding. Sanding removes approximately 1 mil of coating and leaves a mirror-like surface.



This is the type of air conditioned down-draft spray tunnel in which lacquer color coats are applied. Sixteen different colors are available to each sprayer through a circulating system from paint storage room. The four lacquer coats are applied to bake out to specific thickness. Ovens following spray rooms have controlled zone heat.



chine sanding is employed except where hand sanding is required for surfaces not suited to machine sanding. Sandpaper is 320 grit. Sanding removes approximately 1 mil of primer and leaves a mirror-like surface. The remaining primer is sufficient to "fill" the metal and thin enough to prevent field checking in cover coats.

An on-the-line blower dries the body for inspection and pick up of any imperfectly sanded surfaces.

The body is then conveyed through a power "shower" to wash off all sanding residue. A hand wash station follows for pickup of any possi-

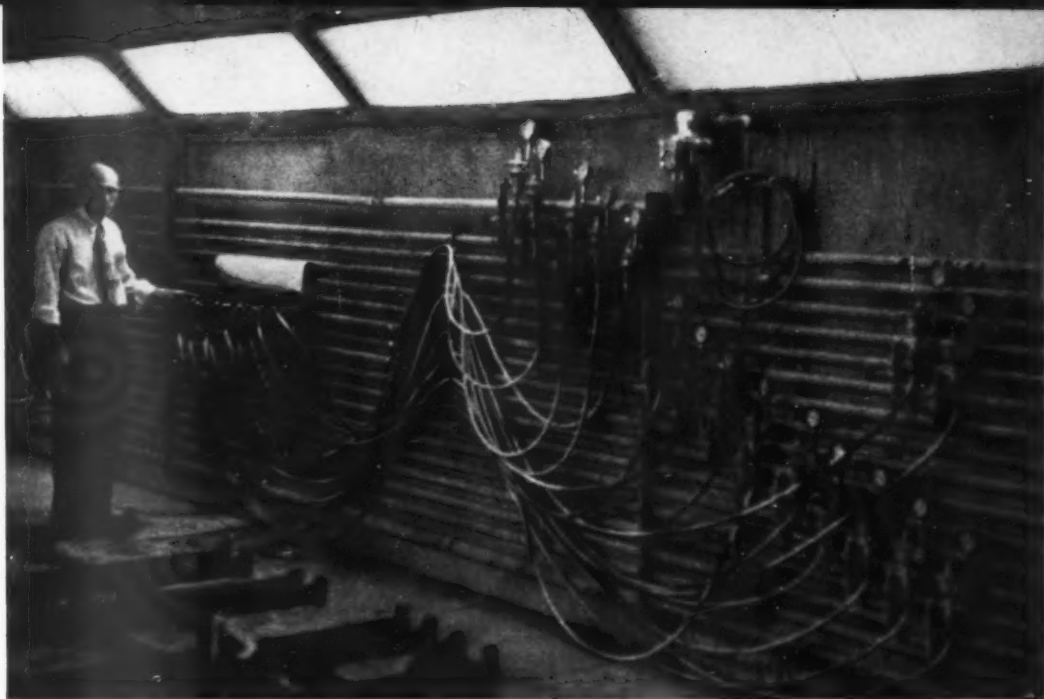
FEBRUARY • 1955 finish

16 colors
at each
spray station →

Typical material supply set-up for a sprayer on a lacquer spray line. A quick attachment of gun to any one of the 16 hose connections and the chosen color is immediately available through the circulating system from paint storage room. Air and material pressures are regulated by supervision only.

finishfotos

Lower right: This small panel controls the complete conveyor system in the paint department. A single synchronizing knob (lower right) can be used simultaneously to increase or decrease conveyor line speeds.



ble remaining residue. There is a compressed air "blowout" of the interior and any entrapped water.

An 80 ft. dryoff oven follows — temperature 220° F.

Next is a "sealer and deadener" booth where a bituminous material is applied to all welded joints followed by a spray coating for the floor, bulkhead and sides and wheel housing of trunk. Joints are sealed first, followed by the overall spray.

Bodies now enter staggered water wash spray booths with elevated conveyor sections for the application of a black rust proofing coat to the underbody and the interior of the body rocker panels. A special spray gun with a long nozzle extension is used for the rocker panels.

Lacquer finish coats

First operations in the application of finish coats follow in a 100 ft. air conditioned (humidity and temperature controlled), pressurized, down draft tunnel.

The first operations preceding spraying are blow off, tack rag cleaning and the application of tuscon red on all bare or thin edges.

The majority of current cars are in "two-tone" so that color application is divided. All lower panels are finished complete (4 coats) in this first finish coat spray room. Upper areas get 1 coat to highlight surfaces for inspection.

Approximately 1½ minutes is allowed for drying between each coat of the 4 coat lacquer application. Then there is a 4 minute flash off before entering the oven.

The finish is then baked in a balanced, pressurized gas connection oven with 4 equal length zones.

Zone temperatures are: Zone 1 — 120° F, Zone 2 — 130° F, Zone 3 210° F and Zone 4, — 220° F.

A wide radius curve in the conveyor passes a well lighted (fluorescent and daylight) inspection station. Any "high" or "low" spots are then corrected.

Dust and moisture proof paper is then applied to finished lower half bodies and jams. Tape is automatically applied to the paper edges on an "apron taper".

Any upper body defects marked by inspectors are then sanded followed by blow off, tack rag, and spray of any bare edges with primer.

The second finish coat line for upper bodies operates in similar sequence to the first or lower body line. (4 color coats)

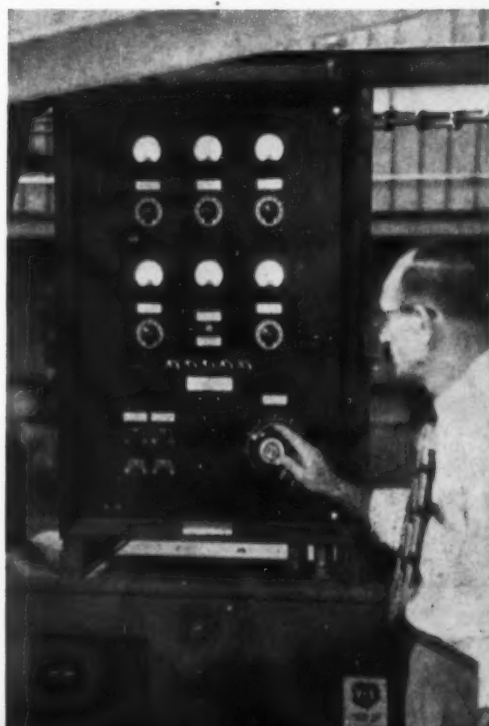
As the bodies leave the finish coat bake the masking paper is removed by operators who also transfer the bodies (2nd break in conveyor) to the polishing line.

Both machine and hand wet sanding is now done using 400 grit paper to remove approximately ½ mil. (Magnetic gauges are used).

Next in line is a 300 ft. well lighted and air conditioned polishing room. Electric motor polishers with synthetic wool polishing pads and liquid machine polish provide the final sales floor lustre.

Final inspection is accomplished at an 80 ft. inspection station. Bodies passing inspection are transferred to a "trim line" for the application of glass and exterior trim.

Any bodies rejected for minor defects at final inspection are immediately repaired and sent through a "repair" oven adjoining the final inspection line. →





View of polishing line for final finish on "sheet metal" parts. The special supporting conveyor cars carry such parts as hoods, front fenders and fender guards.

"Sheet metal" finishing line uses flow coating

Fenders, hoods, fender shrouds, stone shields, etc. receive a flow coat application of black synthetic enamel as a first coat. The flow-coat machine has 28 nozzles under medium pressure. Material is circulated from a 250 gal. adjacent supply tank. The monorail makes three passes through the drain chamber for a total of 210 ft.

The black first coat gets bake in a U type oven at 385° F.

Parts are transferred and scheduled for finish coat on the basis of teletype instructions covering car model and color. Transferred by monorail to a point at the head of the "sheet metal" finish coat line. Here scheduled parts are loaded on fender and hood bucks (floor type conveyor).

Dry sanding (240 grit paper) follows, then tack rag, then tuscon red for bare edges. The parts then pass through a 75 foot spray booth in which the final 3 coats are applied.

The color coats are baked in 2 zones, 150° F and 220° F respectively.

Section of paint storage room from which material is delivered to point of application through closed circulating system. This storage room houses 22 dual units, each consisting of a separate mixing tank and supply tank, plus 11 single units combining mixing and supply tank.

Finishing steps for both bodies and "sheet metal" include wet sanding, polishing, buffing and inspection.

Delivery is by teletype order to front end assembly on the ground floor.

Interior finish paint line

Another paint line is utilized for finishing interior parts such as the instrument board, glove box, garnish moldings, etc.

From the "sheet metal" cleaning and phosphatizing machine these parts go to a separate finishing line.

After prime coat is applied the parts are dry sanded, and then flow to cover coat spraying.

In the first booth a single coat of color is applied to backs. In a second booth 1st and 2nd color coats are applied to the face.

Parts are routed by color and body type. There are 8 different interior colors.

Paint mixing and handling

A fireproof paint mixing room

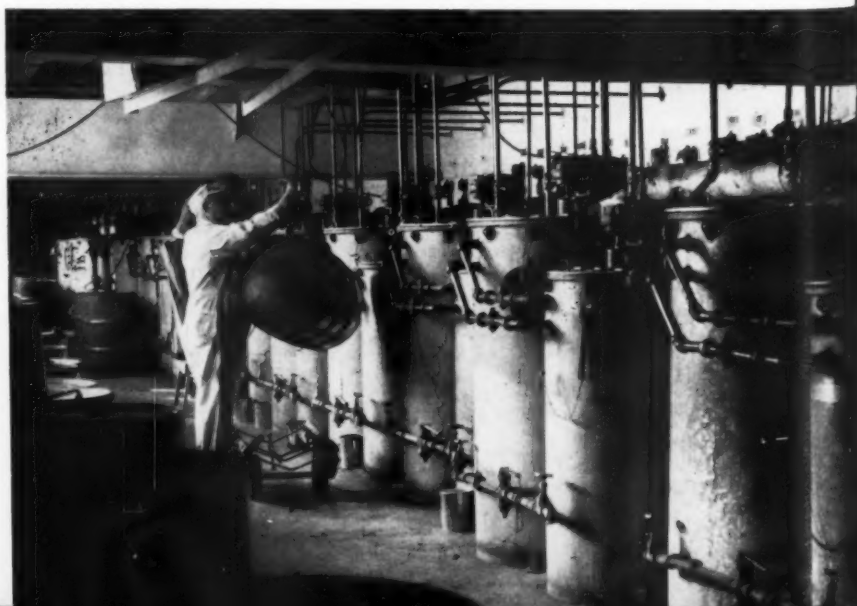
(mezzanine) houses 22 dual units, each unit consisting of a mixing tank and supply tank plus 11 single units combining mixing and supply tank. All paints are agitated in the delivery drum before loading tanks.

All paint supply from this room is in a continuous circulating system. Pressure is 60 lb. at discharge and 25 lb. on return.

At least 17 different colors are supplied through the circulating system. In the spray booths provision is made for immediate change over of colors by merely attaching the gun to any one of a series of supply lines serving each sprayer.

Any "special" color desired can be applied through the use of one of a series of 5 gal. pressure tanks used as standby. The tanks are designed to take a 5 gal. paint can and each has its own agitating mechanism.

This extreme flexibility in the use of colors should be of interest to all manufacturers of fabricated metal products.





The 1955 Packard Patrician



The 1955 Studebaker President Hardtop

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● To protect and preserve the beauty of Studebaker-Packard's great cars, bodies and sheet metal parts are treated with Parker Rust Proof Company's Bonderite before application of the paint.

Bonderite is the standard corrosion resistant paint base in the metal finishing industry. Use of this remark-

able product adds finish durability by anchoring the paint, by resisting corrosion, and by confining finish damage to the site of the injury in case of scratch or dent.

Parker is proud that Bonderite is used as a quality feature on the beautiful new Studebakers and Packards for 1955.

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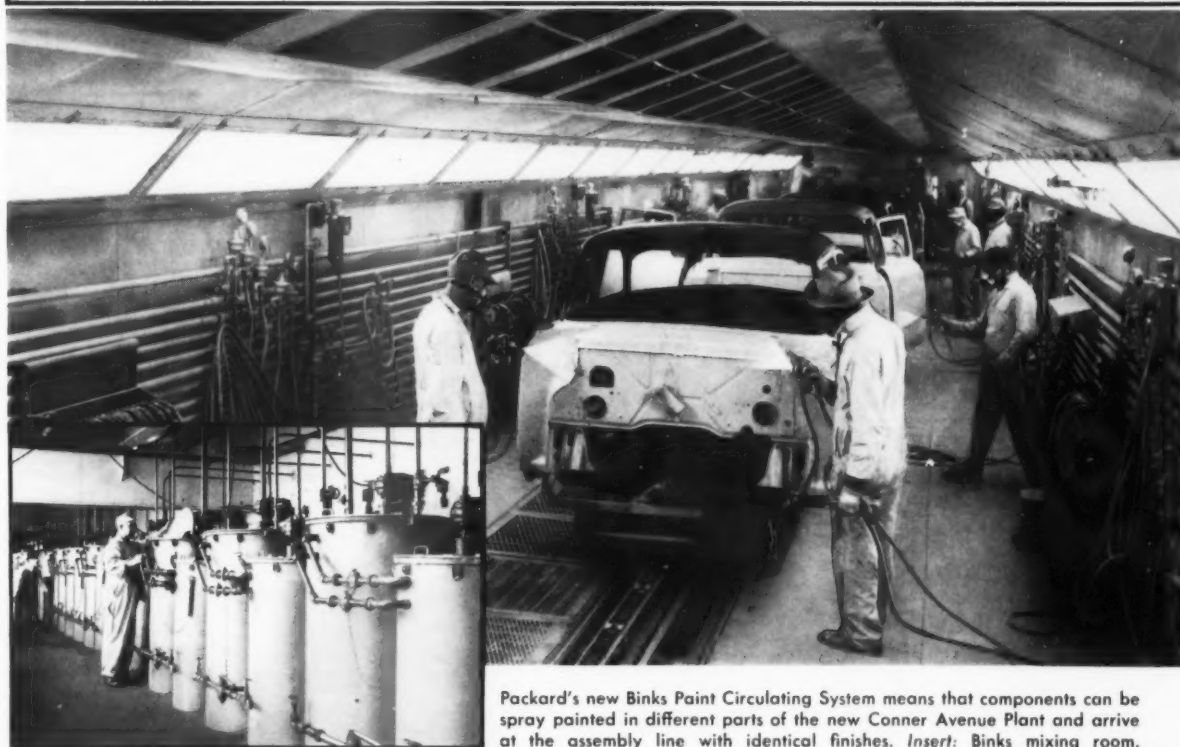


FRAM CORPORATION, Providence 16, R.I. Fram Canada Ltd., Stratford, Ont.

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FEBRUARY • 1955 finish

WHAT'S NEW in paint circulating systems



Packard's new Binks Paint Circulating System means that components can be spray painted in different parts of the new Conner Avenue Plant and arrive at the assembly line with identical finishes. Insert: Binks mixing room.

Bink's paint system helps Packard attain "Complete Coordinated Cooperation"

Here's how a closed-type Binks Paint Circulating System insures Packard's quality control

The lacquer sprayed by every paint spray gun in Packard's new Conner Avenue Plant in Detroit comes from a central source. This insures that parts painted in one end of the plant will perfectly match those finished in another section.

Paint for all operations is prepared under laboratory control in a fireproof paint mixing room which houses 22 dual tanks, (each consisting of a separate mixing tank and supply tank) and 11

single units which combine a mixing and supply tank. Paint is mixed and maintained at 77° F. Color and viscosity are precisely controlled.

16 colors are piped from the tanks to all spray stations. In a matter of seconds, any sprayer can connect his gun to the line carrying the desired color. Uniform and measured paint delivery to each gun is assured by the use of Binks PM-103 Regulators. Atomizing air pressure is closely controlled by Binks AO-120 Oil and Water Extractors at each station.

The Packard paint circulating system allows 52 possible color combinations and is set up to

apply 4 coats of lacquer in 2- or 3-tones. More than 400,000 gallons of lacquer are used each year.

Packard's choice of a Binks paint circulating system and Binks equipment is another example of how that company maintains "Complete Coordinated Cooperation" in all production.

If your production setup has 2 or more spray stations using in excess of 50 gallons of paint each day, it will pay you to investigate this type of installation. The more paint you use, the greater your savings. To learn of the many other advantages of a Binks Paint Circulating System, see your jobber or distributor, or write directly to:

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On the body trim line, chrome mouldings are being added around the windshield and on the doors.

ASSEMBLY operations on the Packard and Clipper cars start on the second floor — soon after the body leaves the paint department.

Assembly starts on the body which is mounted on a 4-wheel body truck pulled by a floor-type drag conveyor.

First, an instruction container is attached to the front side of the bulkhead. This container carries scheduling instructions as to the model, color, etc. for the individual body to which it is attached.

The following parts are then

added: Windshield, back window, side windows, exterior trim, tail lights, power lift for windows, hand brake brackets, ventilator window, panel between back seat and trunk (or deck) lid.

Some of these parts, such as the ventilator window units, are purchased completely assembled, while other parts, such as the other windows, are sub-assembled near the point of installation.

The body then moves down a ramp to the main floor of the plant into a second "trim" section.

Here more component parts are added, including the following: Interior moulding, panels, emblems, rubber weather stripping, wind cord around door, center pillar trim, heater and defroster. The head lining is installed into body and properly located into position (to be "steam" form-fitted later). The steering column bracket, ventilator, back-light, plenum chamber, instrument panel, speedometer, hand brake and rear view mirror follow in order.

Three strips of fiber cloth (vibration deadener) are glued to top side of plenum chamber before the instrument panel is fitted in place and bolted in position. The instrument panel is sub-assembled nearby. The decorative moulding added around the windshield also covers the screws which fasten the top side of the

ASSEMBLY

instrument panel to the plenum chamber.

Electrical power is now used to check the back-up lights, radio, panel lights and tail lights. Instrument panel wiring is also checked with box-type instrument device. Here each car is closed tight and steam is injected in the interior to shrink the head lining trim into a tight fit.

The body is then transferred easily by hand to a cross-over drag conveyor feeding three trimmed body storage lines which can accommodate 84 car bodies.

Adjacent to the trimmed body storage are major sub-assembly lines



Left: "Body drop" area on the main assembly line. At right another car body will be hoisted on same padded hanger, and delivered by overhead conveyor to drop position as next chassis comes down the line. Double steel-slat floor level conveyors move the cars down the long assembly line.



OPERATIONS

for bumpers, hoods, and radiator grilles. Also nearby, the front end assemblies are built up on holding fixtures on an oval-shaped "merry-go-round". This fixture permits the accurate positioning of right and left fenders, radiators, grilles, fresh air vents, headlights, and power brake booster tanks.

The complete front end assembly is then delivered by overhead conveyors to its "drop" position on the main assembly line.

Front and rear seat assemblies are made on a balcony section per schedule of one hour ahead of final assembly.



Above: Overhead conveyors crossing main assembly line and curving 90° to parallel main line. Conveyors, carrying front ends, gas tanks and seats, dip down along the assembly area for removal of sub-assemblies.

Right: A special C-type hanger is used to lift front seats from the conveyor hanger and insert them into position through the right front door.

Final assembly

The final assembly line starts with the chassis frame (which has been assembled on a line running at right angles to the head of the main line). The chassis frame is in an inverted position on its sub-assembly line and then turned over for assembly of wheels and other parts.

The completed chassis frame assembly is then delivered onto a steel slat-type (flush with the floor) conveyor and over a long assembly pit, which is the main assembly line for the car. The motor is first lowered onto the chassis, bolted in position, and connected to the drive shaft. The muffler, exhaust and steering mechanism are tied up.

A scheduled body is rolled off one of the three storage conveyors and is delivered by overhead conveyor to body decking position on the main assembly line. The body truck is returned by overhead conveyor to the body framing department.

The gas tank arrives by an overhead storage and delivery conveyor, and the electric harness for the gas float is installed in position before the tank is installed to underside of the body.

Various operations such as installation of air cleaner, battery, rocker moldings, etc., are performed. The front end assembly is next located to



Tubeless tires are inserted on rim, given partial inflation to hold bead against rim during final inflation in ferris wheel fixture.

the body (similar to body decking) to complete the full car.

On the main assembly line, special air operated lift mechanisms make heavy lifting by employees unnecessary. Such operations include positioning of hood, bumpers and front seats onto the car from delivery conveyors. For example, the front seat is positioned with a C-type handling device which permits use of an overhead hoist. One worker, using the C-hook, lifts the seat off a cradle



hanging from overhead conveyor and inserts it through the right door opening into the body at the end of the final assembly line. The car is serviced with gasoline and water or anti-freeze where the completed new car is first started up.

Inspection

A general quality control inspection is given before the car is driven off the assembly line onto the roll test. At the roll test operation, the rear wheels of car drop into two sets of large rolls which permits the rear wheels to revolve while the car remains stationary for checking the function of the axle, transmission, motor, etc.

The car is then driven to the final test line paralleling the final assembly line.

At the first station a toe-in machine checks the front end alignment. At the same time headlights are adusted and headlight trim is added.

The car is driven onto single-strand steel, floor-type conveyor, with right wheels on the conveyor and left wheels rolling on the plant floor. The first 80 feet of this line includes a floor pit where final hose and under-car adjustments are made.

The car then enters a combination water test and car wash booth where 70 nozzles spray up to 280 gallons per minute. A worker inside the car checks for leaks and marks them for repair.

After adjustments from the inside are made to tighten up the doors against leaks, water is then hosed

over the car as a check to see if proper adjustment has been made. The door trim panel is added (this is assembled nearby about 30 minutes ahead of use). Then the "pork chop" trim (continuation of panel onto the front door) is added, followed by hardware (such as door and window handles).

The car then passes onto a double-strand conveyor which has variable speed between inside and outside conveyor — permitting the car to make a 180° turn without changing direction on the conveyor.

Dual paint repair line

Near the end of the line there are dual paint touch-up lines each of which can accommodate half the hourly production. Thus there is ample time for final touch up. Otherwise it would result in reworking going in a circle—bottlenecking an otherwise efficient production line.

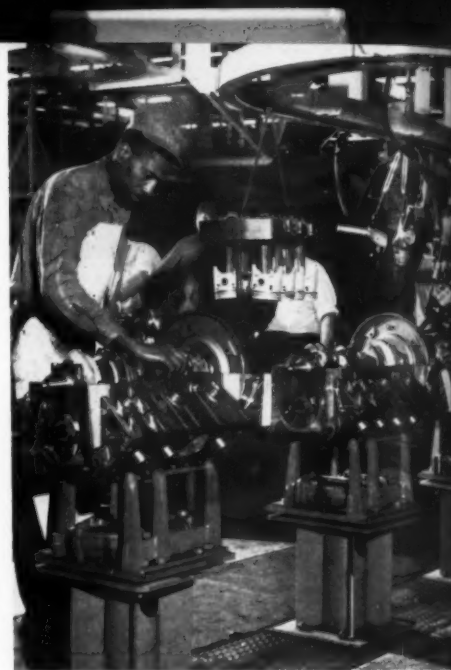
On a final delivery line, the front carpet and front door scuff plates and other appointments are added. Coverings are spread over the carpet and front seat. A kit of tools is placed in the trunk.

All cars are given a rigid final inspection. Any minor adjustments are made before the cars are driven from the plant.

Body fabrication

→ from Page P-48

line are gun welded, picking all area that could not be reached in the preceding operations. As the body



proceeds along the line within a booth, various operations such as arc and gas, welding, soldering, solder grind are performed. Leaving the booth, the front and rear doors and deck lids are positioned and installed on the body.

After these operations, the body in white is complete except for inspection and metal finishing of any metal defects, solder joints, and weld marks. The body moving down this line is checked for general door fits and windshield and back light openings and repaired where necessary. At the same time metal ding and finish men repair this exterior surface of the door and quarter panels. The body, on reaching the end of the line, is given a final inspection and then is transferred to another conveyor which will deliver it to the Paint Department.

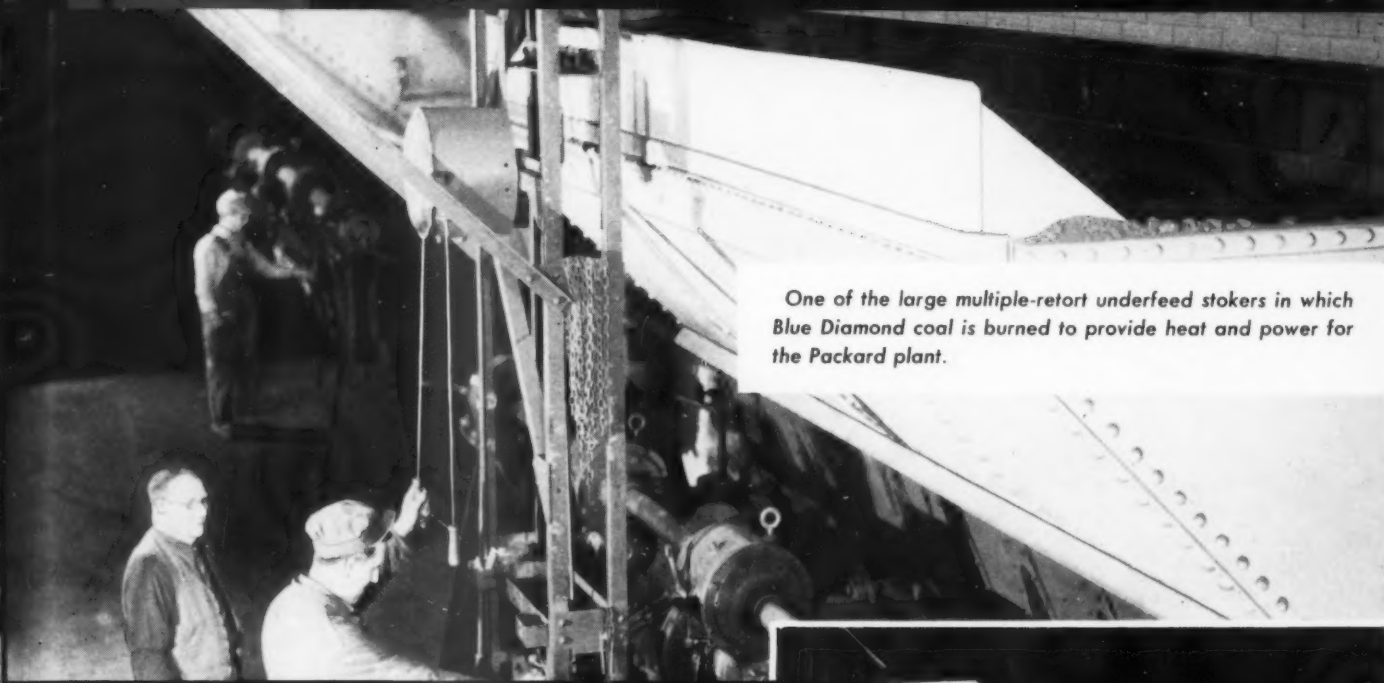
Above: A small section of final motor assembly line at Utica plant.

UTICA

Left: One of three fully-automatic machines for coating operations at Utica plant. This machine is used for lubrite on steel cam shafts—11 stations, 50 racks per hour. Another machine is used for immersion tin on aluminum pistons—14 stations, 50 racks per hour. A third machine is used for sulphuric acid anodizing of miscellaneous parts—12 stations, 40 racks per hour.

FEBRUARY • 1955 finish





One of the large multiple-retort underfeed stokers in which Blue Diamond coal is burned to provide heat and power for the Packard plant.

There's *Advanced Styling* in **BLUE DIAMOND COAL** too!

Down through the years, Packard and Blue Diamond have earned that priceless possession — public confidence. Today Packard forges ahead anew — prepared to challenge the future with ultra-modern concepts of styling and engineering.

Blue Diamond, for 50 years, has been developing modern preparation facilities which insure American industries, like Packard, of the utmost in heat and power at low cost. Blue Diamond Coal, used by Packard, is a specification steam fuel — sized and blended to order, to fit the particular requirements of each plant.

Blue Diamond Coal generates more steam for your coal dollar and we should like to submit the facts to you.



Modern combustion controls in the Packard power plant assure the most efficient and economical conversion into useful energy of the latent heat in Blue Diamond coal.



BLUE DIAMOND COAL CO.

805 DIXIE TERMINAL BUILDING
CINCINNATI 2, OHIO

CHICAGO DETROIT MINNEAPOLIS LOUISVILLE
KNOXVILLE SPARTANBURG

The new Packard . . .

→ from Page P-7

public, but the preliminary reactions have been exceedingly gratifying. Dealers placed over 25,000 advance orders, highest in Packard history, before they had even seen the cars.

We believe that the Clipper line, designed for the medium priced field, has a greater opportunity for 1955 in that field than when it was planned two years ago, because it offers individuality in that price class at competitive prices . . .

As to our second objective, the development of a new management team, the plan followed was to make up the group equally from three principal sources. These were experienced Packard people; executives brought from other companies in the industry to secure the industry outlook; and executives from other industries who would give us a fresh point of view. With this new young team in place, average age of the top 26 executives was reduced from 59 to 46.

Regarding our third objective, the modernization of our manufacturing facilities, a multi-million dollar program carried out in the last year has given the company the most modern facilities in the industry.

It was carrying out these basic objectives that motivated our proceeding to join Studebaker as the fourth full-line producer in the automobile industry last October 1. Here, briefly, is the operating philosophy on which the new corporation is going forward:

Market coverage: To build a truly full-line automobile manufacturing company with passenger cars in four distinct price classes and commercial trucks in the light and medium weight class.

Product philosophy: To offer cars of advanced, distinctive, and individual design and styling; but in keeping with industry patterns, engineered and built to quality standards.

Type of organization: We will work for maximum integration without sacrificing product distinctiveness and other benefits of decentralization in our lines of cars. This organization will conform to the

most successful industry pattern of the multiple-line producers, yet retain for us the individuality of each car line.

Management: To build a management team based on realignment of functions to conform to our type of organization pattern.

Dealer organization: To add strength by taking advantage of our multiple lines of products and franchising only to a limit of the market; by following the policy of maintaining a relationship of common interest with the dealer as a businessman.

Facilities: To continue an aggressive program of modernization geared to volumes of reasonable expectation.

We have only made a start at carrying out the program for which we have set the base in our operating philosophy. One of the first benefits has been in holding the price line on the 1955 cars, although we have built in more quality and a great deal more cost. We can do this because of the benefits of our modernization program and from manufacturing savings as a result of combining some operations with Studebaker. By keeping our cars directly competitive in their price classes, we feel that we have underwritten a sales year to meet the goals we have set for production.

At Packard, production has been scheduled at 100,000 cars for this year. We feel that 1955 will be a good year for the automobile industry with 5,600,000 passenger cars produced. This will be about 400,000 more than the 1954 production, and the increase should result from the high income levels; from the level out within the industry by which the gap is narrowing, competitively speaking; and from a much more effective dealer and selling activity.

Manufacturing . . .

→ from Page P-9

do not meet the high standards established.

Behind the completion of the modernization program in record time, of course, were the new men who make up the manufacturing team.

Under the operations vice president is Neill S. Brown, general manufacturing manager, who also directs operations of the corporation's other body and assembly plants in South Bend and Los Angeles. He was with Ford Motor company for 35 years. John D. Gordon, director of manufacturing-engineering, came to Packard in 1953 after 30 years in various engineering assignments and consulting positions. The new plant layout, methods and standards were worked out under his direction.

With Packard's long and well-known record as a defense producer, manufacturing studies are being carried forward to adapt the vacated facilities in Detroit to defense manufacturing assignments. The company is now engaged in development and research on gas turbine engines, diesel tank engines, and other projects in the field of electronics, such as guided missiles. A large part of the company's research and production facilities are expected to be devoted to these projects in the future.

In addition to consolidations of operations already accomplished, present working plans will bring into both Detroit and South Bend plants, some components on which savings of several million dollars a year are expected. When these manufacturing moves are completed, following studies now underway, they will reflect additional cost savings to the corporation.

Engineering . . .

→ from Page P-11

low end of its engine speed rather than at the high speed.

We have completely redesigned our Ultramatic transmission to give drivers for the first time a choice of two driving ranges, one with the fluid smoothness of start and the other with quick getaway and rapid acceleration. There are over 100 other features, many of them "firsts" such as a windshield wiper which cleans the curved surfaces at the side of the sweeparound windshields.

From an engineering standpoint, Packard has the most competitive product it has had in a generation.

NEW '55 PACKARD V-8 with AUSCO 80 Cast Alloy Steel Crankshaft Exceeds 150 World Records!

Ausco 80 Cast Alloy Steel Crankshafts, identical to the one used in the record-eclipsing Packard test car, are standard equipment throughout the entire '55 Packard line.

These crankshafts have unsurpassed wear-resistant properties as well as extra strength with minimum weight.

In casting Ausco 80 crankshafts, extremely close tolerances are maintained. This minimizes final machining and simplifies balancing. Hot processing eliminates internal stresses. Crankshafts remain true in machining and in operation.



Crankshafts from each day's production are photographed under this million-volt x-ray apparatus.

Auto Specialties Mfg. Co., maker of the Ausco 80 Cast Alloy Steel Crankshafts, are specialists in producing castings in the volume required for automotive assembly lines. For complete details and engineering data, send for folder on Ausco 80 Cast Alloy Steel.

Unretouched photograph showing quality casting obtained with Ausco 80 Cast Alloy Steel.



1955 PACKARD 400 HARDTOP—Powered by new 260-horsepower V-8 engine which incorporates AUSCO 80 Cast Alloy Steel Crankshaft.



DETROIT — The 1955 Packard V-8 shattered more than 150 world records for stock car speed and durability, traveling 25,000 miles at an average of 104.7 mph. Only minor mechanical adjustments were made during the record test runs.



Designing • Research • Production • Inspection • Road and Field Testing . . . all have been working side by side for nearly 50 years at Auto Specialties Mfg. Co. to make better automotive parts.

Among the many products made by Auto Specialties Mfg. Co. are



Ausco "Y" Section Mechanical Bumper Jacks—Standard equipment on all 1955 Packards.

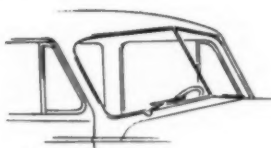
Ausco Saf-Lift Bumper Jacks and Hi-Range and Standard Hydraulic Axle Jacks.

Ausco Automotive Castings: Malleable and pearlitic malleable iron and steel castings for large and small automotive parts.

Ausco Double-Disc Brakes: Self-energized—ready now for cars and trucks.

AUTO SPECIALTIES MFG. CO. Dept. F-55, St. Joseph, Michigan
Plants also at Benton Harbor and Hartford, Mich. and Windsor, Ont., Canada.

Look what's happened to the glass in cars!



The pictures tell part—and *only* part—of the story of What's happened. Behind this advance from propped-up pieces of plate glass to the sweeping Panoramic Windshield is the research and engineering of one company in particular.

Most of the new ideas in automotive glass first became realities in the development department of the Libbey-Owens-Ford Glass Company. Some were fairly easy. Others took years of research, experimenting and testing. All have been successful.

Where will the next great advancement come from? Look at this record and judge for yourself!

1. L·O·F was one of the pioneers in the manufacture of safety glass for automobiles.
2. L·O·F actively participated and contributed to development of Hi-Test, the superior polyvinyl butyral plastic bond for safety glass.
3. L·O·F pioneered volume production of the one-piece and two-piece curved windshield, and the compound curve for back lights to fit streamlined design.
4. L·O·F pioneered E-Z-EYE, the blue-green safety plate glass and the shaded windshield for passenger cars.
5. L·O·F developed the great new Panoramic Windshield, the style setter for the future.

Libbey-Owens-Ford is proud to have supplied safety glass to Packard for over 25 years. Panoramic windshields are being furnished for 1955 models in both plain and shaded E-Z-EYE.



LIBBEY • OWENS • FORD

Toledo 3, Ohio

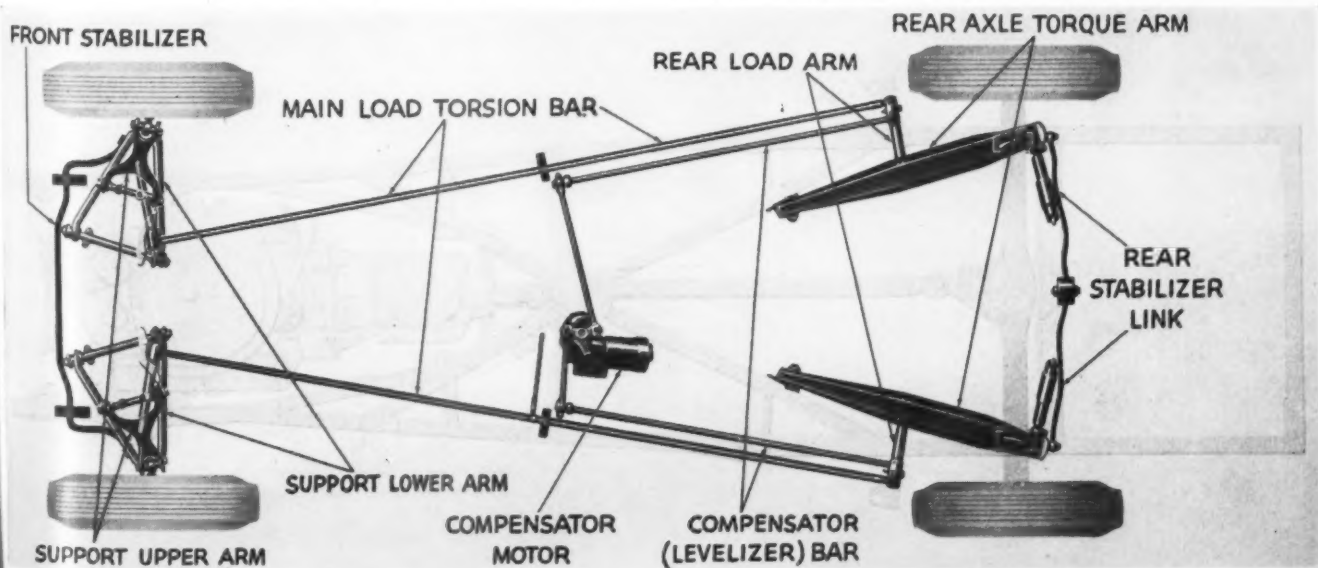


The Packard Patrician



Details of the Torsion-Level Ride System

A feature of the new Packards and the 1955 Clippers is a new type suspension system which eliminates the use of coil and leaf springs. As shown in the diagram, two long steel bars running the length of the car takes the shock of road bumps and dips by twisting. This means that these road shocks do not reach the car frame and car passengers. A separate load compensator keeps the rear end of the car level with the front end, regardless of passenger or luggage weight.





STUDEBAKER~
PACKARD

*knows but
one way
to go -
and that's
AHEAD!*

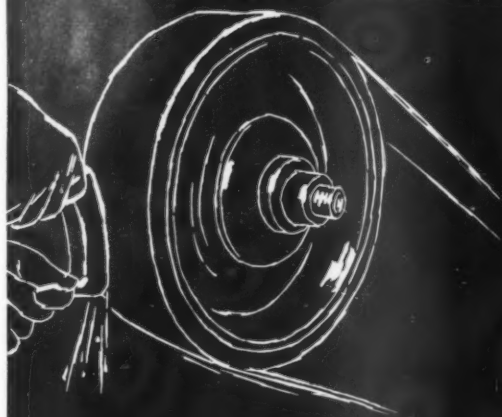
Borg-Warner



THESE UNITS FORM BORG-WARNER, Executive Offices, Chicago: ATKINS SAW • BORG & BECK • BORG-WARNER INTERNATIONAL • BORG-WARNER SERVICE PARTS • CALUMET STEEL • DETROIT GEAR • FRANKLIN STEEL • HYDRALINE PRODUCTS • INGERSOLL CONDITIONED AIR • INGERSOLL KALAMAZOO • INGERSOLL PRODUCTS • INGERSOLL STEEL • LONG MANUFACTURING • LONG MANUFACTURING CO., LTD. • MARBON CHEMICAL • MARVEL-SCHUELER PRODUCTS • MECHANICS UNIVERSAL JOINT • MORSE CHAIN • MORSE CHAIN CO., LTD. • NORGE • PESCO PRODUCTS • REFLECTAL CORP. • ROCKFORD CLUTCH SPRING DIVISION • WARNER AUTOMOTIVE PARTS • WARNER GEAR • WARNER GEAR CO., LTD. • WAUSAU • WESTON HYDRAULICS, LTD. • WOOSTER DIVISION

NEW

SPRAY LUBRICATION



FOR ABRASIVE BELTS



Economical . . . clean . . . easy to apply—Stuart's New Excelene Grinding and Polishing Oils improve surface finish and increase belt life production as much as 50 to 100% on many abrasive belt grinding and polishing operations. Two types of Excelene, FD for ferrous metals, and NF for non-ferrous metals, are available from your abrasive belt distributor in easy-to-use 12 oz. pressurized cans.

It's easy to *spray production* on your abrasive belts with Excelene. Here are two examples:

A jet engine parts manufacturer obtained 275 pieces per belt polishing type 403 stainless steel dry. Excelene FD Polishing Oil increased belt life to more than 600 pieces each.

An aluminum cooking utensils manufacturer was getting 75 pieces per belt with grease stick lubrication—and using four gallons of solvent per operator each day to clean the belts. Excelene NF Polishing Oil not only kept the belt clean but increased belt life to 135 pieces each.

Call your abrasive belt distributor today—or fill out the coupon at right.

More than a "Coolant" is Needed

D.A. Stuart Oil Co.
EST 1865 LIMITED

For further information on
STUART'S EXCELENE

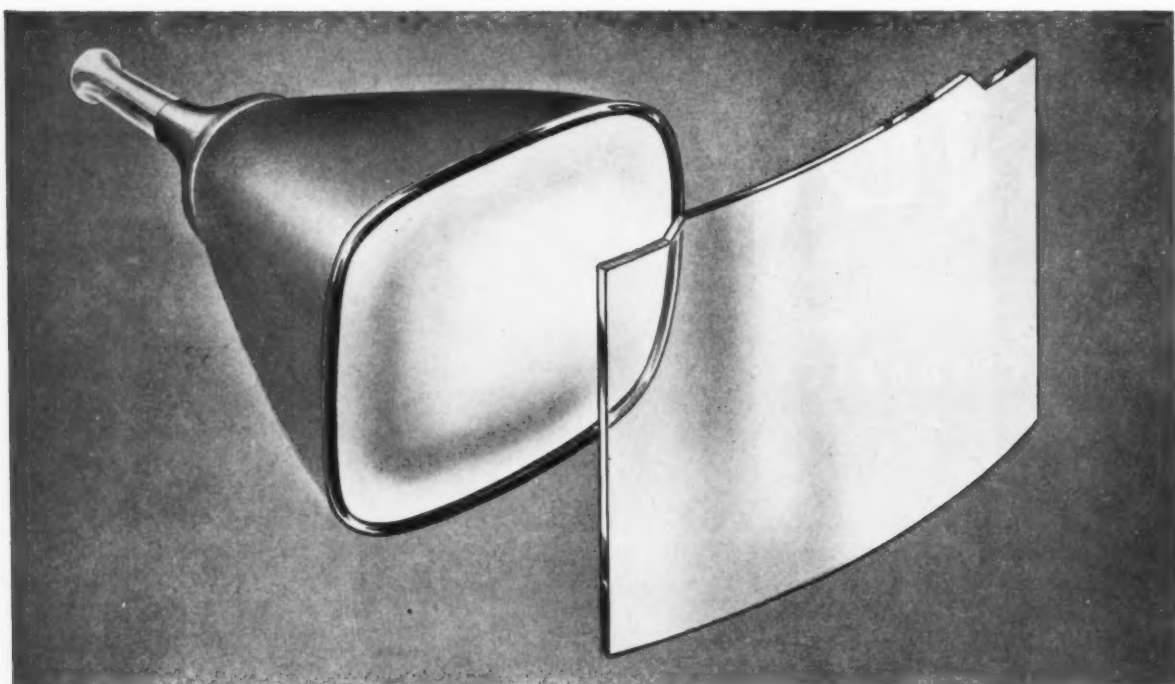
Clip to your company letterhead and mail to:

D. A. Stuart Oil Co., 2747 S. Troy St., Chicago 23, Ill.

Name _____

Title _____

Name of your Belt Distributor _____



MARSCO

precision glass parts

FOR UTILITY AND BEAUTY

Glass — enhances the beauty and broadens the acceptance of your product whether in the utility appliance field or the growing electronic industry.

Glass — adapted with skill and precision by MARSCO to meet your product requirements — For Today — For Tomorrow.

Glass — flat as can be — precisely shaped to fit.

Glass — bent—convex—drilled—to the most exacting tolerance.

Glass — hardened, heat-treated or tempered to survive your consumer usage unscathed.

Join the major appliance manufacturers now enjoying extra sales from the appeal and prestige contributed thru the luster of glass — MARSCO'S Crystal Clear Glass.

Our engineers are experienced in incorporating glass as viewing windows in domestic appliances and television cabinets.

A simple request to us solves your problem.



MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.



Bent Glass

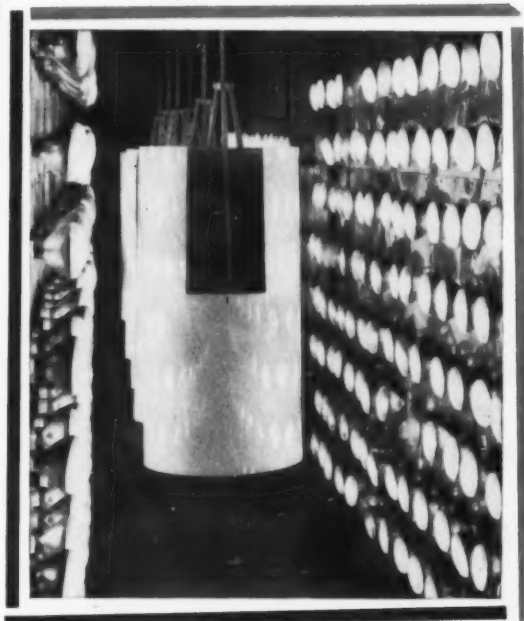
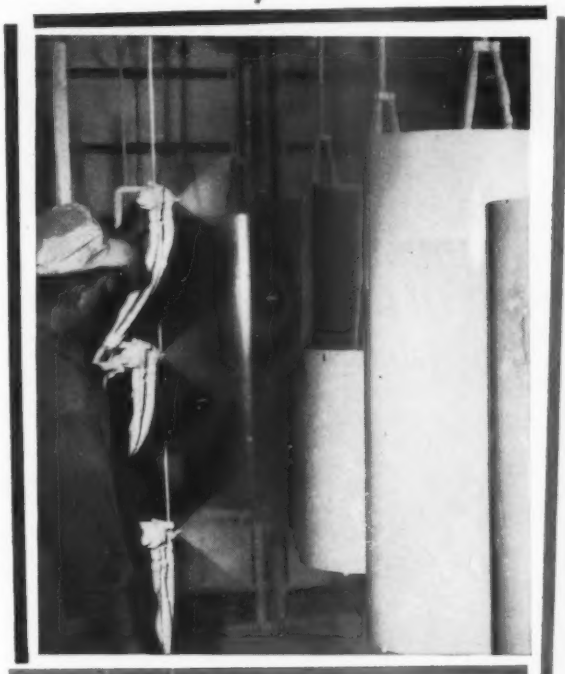


Convex Glass



Heat-treated Glass

30 MINUTES



TOUGH FINISH ... on tough time schedule!

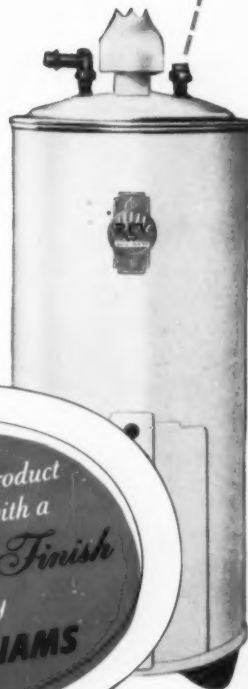
Tough finishes are not tough problems—with unlimited time for baking or curing. When extremely fast baking schedules must be met, however, it takes an outstanding material to produce the long-lasting mar-resistance demanded for hot water heaters such as the Rex Heater, produced by The Cleveland Heater Co.

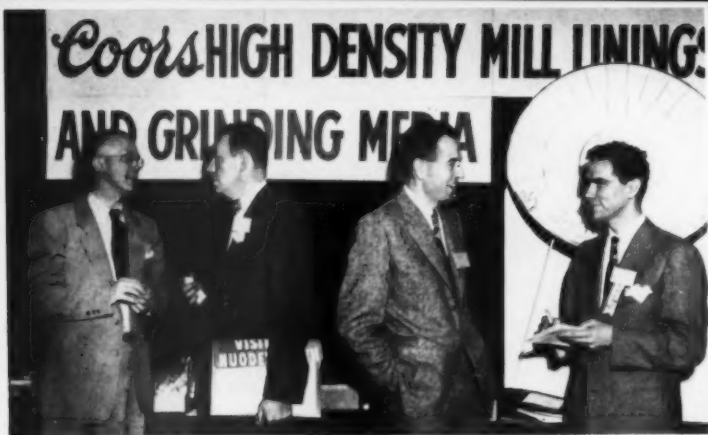
Thanks to Sherwin-Williams KEMCLAD® Appliance White, a total time cycle of 30 minutes is maintained in the finishing of these jacket exteriors, from bare metal, through automatic, electrostatic spray equipment and infrared oven, to finished jackets ready for assembly. Resulting finish has high hardness with flexibility . . . lasting gloss and washability . . . ability to withstand heat without discoloration.

If greater toughness, or faster baking—or BOTH—are properties you can use, it will pay you to investigate KEMCLAD. Call, wire or write: The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.



SHERWIN-WILLIAMS
Industrial Finishes





SNAPSHOTS FROM THE PAINT INDUSTRIES' SHOW



finishfotos



finishfotos

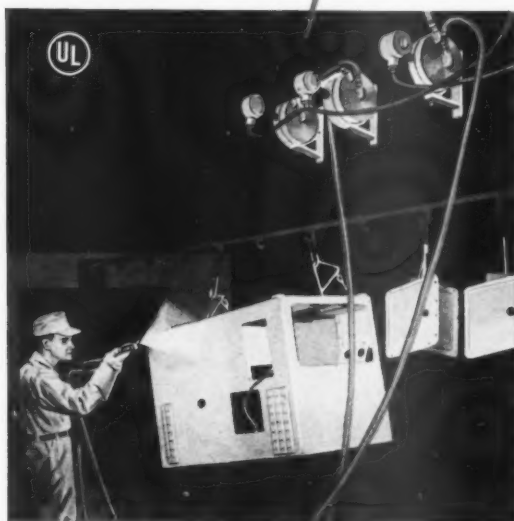


**"look how we
reduced our
production
costs with...
SPEE-FLO"**



8272

- Faster application
- Material savings by reduced overspray
- Better finish
- Reduced rejects



SPEE-FLO CORP. 720 POLK AVE.,
HOUSTON, TEXAS

SPEE-FLO HOT SPRAY HEATERS

Ask for an on-the-job demonstration

Don't Delay - Mail Today!

THE SPEE-FLO CORP., Dept. 2x-5, 720 Polk Ave., Houston, Texas
Builders of practical industrial and automotive hot spray equipment.

Please send me information on your line of hot spray heaters best suited to our work. Type of products being finished _____

Application is conveyORIZED _____ turntable _____ mobile _____ other _____

Average volume of material per gun per hour _____

Type of material _____ Please have representative call _____

Name _____

Company _____

Address _____

City _____ State _____

New

Supplies and Equipment

B-10 New spray lubrication for abrasive belts

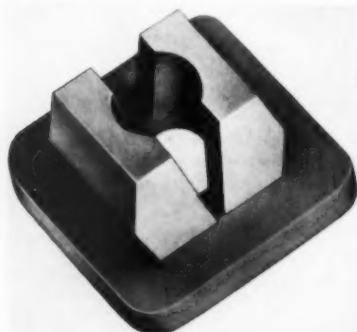
New New Excelene grinding and polishing oils for use with abrasive belts will improve surface finish and increase belt life and production as much as 50% to 100% on many abrasive belt grinding and polishing operations. Available in 12 oz. pressurized cans, it is economical, clean and easy for operators



to handle and apply. Two types are available, Excelene NF for use with non-ferrous metals and Excelene FD for use with ferrous metals. Folder is available from the company containing further information and case histories on use of the product.

B-11 New snap nut speeds "Problem" assembly

New A plastic blind screw receptacle to eliminate multiple parts and cut assembly costs has



been developed. This new nylon snap nut locks and stays tight even under severe vibration, and is ideal for a

More Information

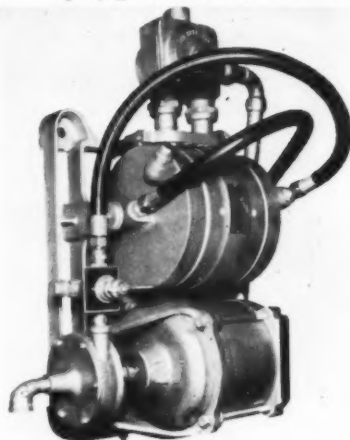
For more information on new supplies, equipment and literature reviewed here, fill out the order form, or write to us on your company stationery.

variety of applications in the electrical appliance, automotive, and other mass-assembly industries. The grommet snaps into position under finger pressure to receive a thread-cutting screw. It is impervious to rust, and the plastic characteristics eliminate danger of chipping porcelain or enamel.

B-12 New all electric hot spray heater

New This new unit combines the proved experience of a coil-less heat exchanger with the "paddle wheel" simplicity of an electric powered centrifugal pump designed to handle all types of industrial finishes, regardless of their abrasive content, and requiring little or no maintenance. It heats the paint,

maintaining a uniform temperature at the spray gun, and at constant fluid



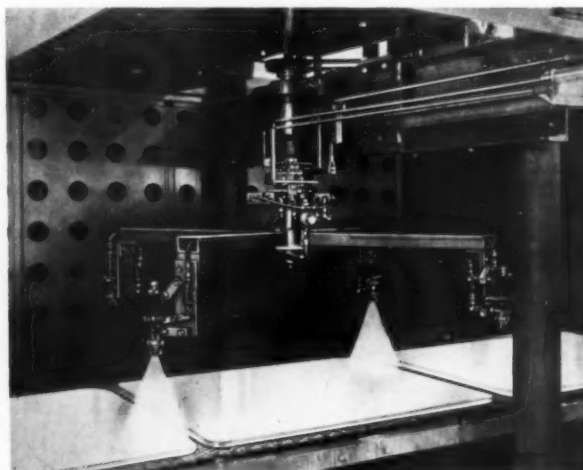
pressure. Air pressure variations do not affect fluid pressure in this all-electric unit. Installation is as simple as connecting a hose line, and full heat is reached in four minutes.

The principle of heated application of paint is not new, but the development of a complete automatic pressure and temperature controlled hot-spray heater that is simple and maintenance-free is now offered.

B-13 New rotary spray painting unit

New The new machine applies coatings of controllable thickness at conveyor speeds as high as 100 feet per minute. The four

spray guns are closely synchronized with the speed of the conveyor and the width of the product. The guns operate only when they are directly over the ware. Overspray is reduced to the minimum.



New Industrial Literature

201. Catalogs on aluminum fabricating

New A well known company is offering three different catalogs. They are: a 24 page catalog entitled "Catalog of Facilities", a 20 page catalog entitled "Aluminum Appliance Parts" and an 8 page catalog, "Aluminum Roll Formed Shapes."

202. "Selection and Application of Pilot Lights"

New This brochure contains information on pilot light assemblies and small lamps. Included are working tables, data, photographs, and product information of interest to designers and engineers.

203. 1955 reference guide for silicone products

New This 8 page guide is important to design, production and maintenance engineers. Gives comprehensive summary of properties and applications for silicone products most widely used. Products are indexed by type of application.

204. Tangent bender brochure

New Should be of interest to all men concerned with fabrication. This descriptive brochure provides latest information on tangent bender equipment.

205. Book on metal mouldings

New This book entitled "Plan Book of Metal Mouldings" should be of interest to those connected with the design or production of appliances or metal furniture.

206. Socket lamps and assemblies

New This well known company is offering a catalog on

their complete line of assemblies and socketed lamps.

207. Book on flow coating

New This book provides case history information and the names of companies using a new type of cost cutting flow coating equipment. Among other advantages this equipment is said to reduce paint consumption, air makeup, manpower requirements and maintenance.

208. Manual on porcelain enamel

New This engineering manual provides the latest design information on this material. Explains methods of reducing costs and increasing salability of your products.

209. How to cut metal cleaning costs

New This metal cleaner file contains data on how you can reduce your metal cleaning costs and still improve quality.

210. "Mark-It" Manual of decal nameplates

New Manual contains valuable full-color guide to industrial problems in marking, identification, instruction and information.

211. "What You Should Know About Continuous Spray Pickling"

New A leading company offers a free 12 page illustrated booklet, "What You Should Know About Continuous Spray Pickling." With an introduction on the process of spray pickling, the booklet discusses the pickling of drawn parts and the preparation of steel for porcelain enameling.

212. Packing and shipping

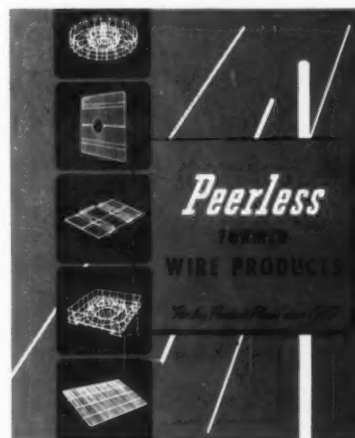
New "What to Expect from Wirebounds" is a booklet containing complete information on wirebound type boxes and crates. Explains what wirebound boxes and crates can do for you and your packaging problems.

213. Epon resin-based enamel

New "Planning to Paint a Pyramid?" gives you complete information on the new Epon resin-based coatings. These new coatings are said to have excellent adhesion, high resistance to impact and abrasion plus outstanding resistance to moisture, heat and corrosives.

214. New brochure on formed wire products

New A new 8 page brochure on formed wire products and plant facilities for formed wire man-



ufacturing shows operations from wire storage warehouse to final inspection and shipping. This valuable booklet is of particular importance to purchasing men, production supervisors and design engineers in its presentation of wire fabrication processes, facilities and close working programs with customers.

215. New brochure on one-terminal sub-miniature pilot lights

New The sub-miniature pilot lights described in this brochure

to Page 123 →

HAVING A WAY WITH WIRE!



HAVING A WAY WITH WIRE is a special talent with *Peerless*. Fabricating to specifications and drawings is one problem. Constructing to specifications economically is another.

Peerless products are quality products. There is no compromise where quality is a factor . . . yet production knowledge consistently assures highest quality at lowest possible prices.

It's here at *Peerless* where you should investigate when wire formed products are a factor in your engineering and costs. *Peerless* can do it better, faster, at less cost.

Send us your prints for quotations by return mail

Peerless

WIRE GOODS COMPANY, INC.
2702 FERRY STREET
LAFAYETTE, INDIANA

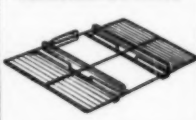
FROZEN JUICE RACKS



DISH-WASHER RACKS



REFRIGERATOR TRAYS



"HOW MEYERCORD
SERVES INDUSTRY"
No. 4 of a Series

MEYERCORD
Nameplate **DECALS**
Help Consumers USE
Your Product Correctly

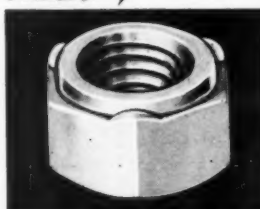
Meyercord Nameplate Decals on your product promote proper use by the consumer. Use Meyercord Decal Nameplates for operating instructions, safety signs and warnings, indicators and guides, lubrication charts, dial and gauge markings, and wiring diagrams. Meyercord Dealer nameplates refer the user back to the dealer for parts and replacement. Meyercord Decals are individually engineered for quick, easy application to any commercial surface, without change in your present assembly line, for long or short production runs . . . at astonishingly small cost per unit. Let a Meyercord Decal engineer study your product and make specific recommendations . . . without obligation . . . as another Meyercord service to industry.

FREE! "Mark-It" Manual of Decal Nameplates
Send today, on your company letterhead, for full-color guide to every industrial problem in marking, identification.

THE MEYERCORD CO.
World's Largest Decalcomania Manufacturers

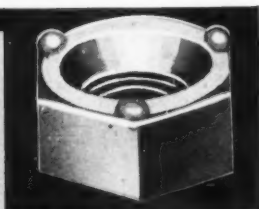
DEPT. D-321
5323 WEST LAKE ST.
CHICAGO 44, ILLINOIS

**WHEN
YOU
NEED** a nut for blind assemblies or
extra threaded depth, use one
of these 2 **WELD NUTS**



**Gripco Pilot-Projection
Weld Nut**

Circular pilot designed for quick, easy positioning of nut over bolt hole for instant resistant welding. No jigs, no fumbling, no waste of time. Furnished with or without famous Gripco locking feature.



**Gripco Countersunk
Weld Nut**

Eliminate time-wasting retapping of nuts after welding. Exclusive countersunk nut bottom does away with fouling of nut threads by weld spatter. Available with or without Gripco locking feature.

Gripco weld nuts are proud members of the Gripco Lock-Nut family that has for 50 years provided positive holding action for quicker fastening application at less cost. Also included in the Gripco line: Gripco Lock Nuts, New Gripco "Clinch" Nuts, Gripco Hi-Nuts in all standard sizes. For any fastening problem, look to Gripco first. Write for samples and full details.

GRIP NUT COMPANY

"after 50 years"

still holding strong"

308-Q S. MICHIGAN AVE., CHICAGO 4, ILL.

FEBRUARY • 1955 finish

FERRO...



your **ONE BEST** source
for **ALL Porcelain**
Enameling Supplies

Slump Tester	Rotosprays and Parts
Thickness Gauge	Automatic Spray Machines
Ferro Built Dryers	Continuous Furnace Tools
Asbestos Mitts	Spray Equipment: Safety Block and Tackle, Containers,
Asbestos Slip-on Patches	Transformers, Compressors, Fans, Tanks,
Stencil Brush	Turntables, Parts, Hose, Fittings, Reflectors, etc.
Adjustable Edging Brush	Muffles, Muffle Brick and Tile
Flat Cleaner Brush	Radiant "W" Tube Muffle Centre Wall
Bolt Hole Brush	Rubbing Stones, White Alundum, 60 Mesh, 80 Mesh
Beading Sponges	and 150 Mesh
"Ferro-Processed" Clays	Frits, Porcelain Enamel, Acid-Resisting and Non-Acid-
Electrophotometer Unit	Resisting: Ground Coats, Cover Coats, Black Edging
Color Oxides by Ferro	Furnaces—Batch, Continuous, Laboratory—All Fuels
Magnetic Separators	Complete Line of Laboratory Equipment
Plain Loop Racks	Boric Acid • Ammonium Carbonate • Zinc Oxide •
Hanging Racks	Borax • Bentonite, Purified • Gum Tragacanth •
Point Loop Racks	Sodium Nitrite • Magnesium Carbonate • Potassium
Straight Point Bars	Carbonate • Nephelite-Syenite • Single Nickel Salts
1" Triangle Bars	Compressed-air-operated Ejectopump
Burning Bars	Porcelain Lining Blocks and Balls
	Pickling Equipment
	Mills

if you don't have a copy of
our latest price list write us;
we'll mail you one promptly.



FERRO CORPORATION

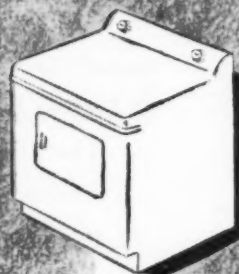
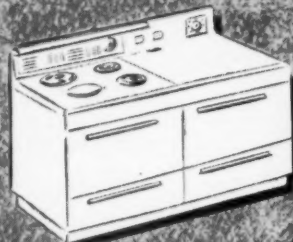
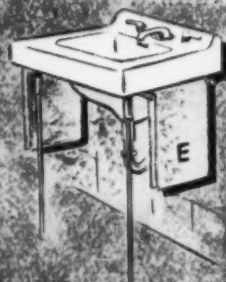
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In Canada: Ferro Enamels (Canada) Ltd., Oakville, Ontario



**Mrs. America may
never know the reason,
but...**

**She Will Notice
the Difference!**



A gleaming porcelain enamel refrigerator, range, washer or sink adding functional beauty to the most modern kitchen... a sparkling bathtub and wash basin... all these get the nod of approval from your most critical judge—Mrs. America. Yes, she may never know that a small quantity of Foote lithium hydroxide is the reason, but she will notice the difference... at first in eye appeal that closes the sale... and later in better wear resistance that proves your point on quality.

Your best finish deserves the ingredient that makes the difference... Foote lithium hydroxide.

Now is the time to cast your plans in terms of an assured supply of Foote lithium. Write today for information about the supply and advantages of unique lithium compounds for your ceramic products.



**LITHIUM HYDROXIDE
FOR INDUSTRY**

**Kings Mountain,
N.C.**... where
Foote is mining
large deposits
of spodumene.



Sunbright, Va.
... the world's
largest lithium
chemical plant.



FOOTE MINERAL COMPANY

412 Eighteen West Cheltenham Building, Philadelphia 44, Pa.

RESEARCH LABORATORIES: Berwyn, Pa. • PLANTS: Exton, Pa.; Kings Mountain, N.C.; Sunbright, Va.

→ from Page 119

chure are all of the one-terminal type for use on grounded circuits. They require a single 15/32" clearance hole, and are intended for use with T-1-3/4 bulbs which are tiny incandescent lamps having bases referred to as the midget flanged type; voltages range from 1.3 to 28.0.

Five different groups of units are described. A complete variety of lens colors are available. Each pilot light is available with soldering terminal, or binding screw terminal.

216. New bulletin on finishing room air-conditioning units

New This new bulletin provides valuable information on the finishing of room air-conditioning units. It contains the latest information on coverage rates, baking schedules, metal preparation, priming and enameling. It all adds up to how you can obtain better appearance and protection for your units.

217. Automatic plating equipment

New This booklet features automation in plating. It covers automatic plating equipment that can be built to suit needs ranging in size from 20 feet to 500 feet in length. Of interest to all concerned with metal finishing.

218. Pre-plated metals

New A 24-page booklet of illustrations and data covering properties, uses and fabrication techniques for pre-plated metals. Points out design, production and sales benefits of using this type of material.

219. Facilities booklet

New This company offers a booklet describing their complete facilities. It should prove of interest if you are interested in any of the following facilities: die design, draw die developments, die construction, complete die tryout, stampings, production assembly, welding, phosphate coating, flow

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222. High density grinding media

New A new 12 page technical bulletin on high density grinding media and mill lining brick of alumina ceramic has just been published. This new publication is designed to assist users of ball mills and pebble mills in obtaining maximum grinding efficiency and the elimination of color contamination through the use of high density grinding media and lining brick.

coat, spray painting and baking, quality control and packaging.

220. Aluminum fasteners and screw machine parts

New A new 8 page booklet which illustrates and describes aluminum fasteners and screw machine products is available. Included are bolts, screws, binding posts, rivets, washers, knobs, nails, and license plate fasteners. Special products that can be made up to customer specifications on a wide variety of screw machines, headers and secondary equipment are also illustrated in the booklet.

Specific recommendations on mill operation that are included are based on practical experience in the milling of many materials including paint pigments, ceramics, porcelain enamel frits, minerals, etc. One section of this bulletin is devoted to actual case histories which show how the use of high density media can save production time and thereby cut manufacturing costs.

221. "New Angle on Greater Profits"

New An ingenious brochure with an actual aluminum part attached citing the advantages of the lightweight metal for screw machine stock has been published. Each folder has a knurled cap part fastened to a drawing of a piece of aluminum stock protruding from a screw machine collet and illustrating tool angle. The attached part was ordered specially to document a test conversion from brass to aluminum to produce the part. A cost savings of 33.7 per cent favoring aluminum compared to brass on the basis of 10,000 piece lots is reported.

FINISH
York Street at Park Avenue
Elmhurst, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. _____ No. _____ No. _____ No. _____

No. _____ No. _____ No. _____ No. _____

Name _____ Title _____

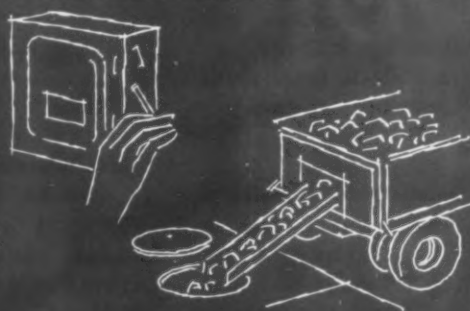
Company _____

Company Address _____

City _____ Zone _____ State _____

Question: When you want
SPECIFIC CHARACTERISTICS
 in a finish what finish
 offers you **HIGHEST DEGREE**
OF VERSATILITY

Answer:



PORCELAIN ENAMEL

Don't overlook the fact that porcelain enamel can be CUSTOM-FORMULATED to your INDIVIDUAL REQUIREMENTS . . . a factor that may give your product the SALES OR PERFORMANCE EDGES you seek.

Discuss the characteristics you desire in a finish with Pemco. Pemco's experience in the development and application of thousands upon thousands of custom frit formulations is a factor in Pemco's known ability to usually "come up with the right answer."



PEMCO CORPORATION • BALTIMORE 24, MARYLAND

Manufacturers of "The World's Finest" Porcelain Enamel Frits for steel, cast iron and aluminum, Coloring Oxides, Screening Pastes, Glaze Frits, Body & Glaze Stains, Underglaze and Overglaze Colors, Vitrifiable Glass Colors.

NEWS

FRIGIDAIRE EXPANDING

APPLIANCE LINE

H. F. Lehman, general sales manager, Frigidaire division, General Motors Corp., has predicted that appliance industry sales this year will be 10% greater than 1954.

Frigidaire earlier announced its entry into the automatic dishwasher and food waste disposer business. Lehman said a further expansion of product lines would be revealed before the end of the year.

Looking at the dishwasher business, Frigidaire officials forecast industry sales for 1955 as \$68 million and 1958 \$89 million.

MAGIC CHEF PAYS LOANS

Cecil M. Dunn, president, Magic Chef, Inc., St. Louis, Mo., reports the payment of the final balance of short term bank loans which stood at \$1,700,000 when he became president in 1954. The company is now completely free of bank debt.

ADMIRAL PLANT EXPANSION

TO CONTINUE, EXPECT GOOD

TELEVISION YEAR

Television receiver sales during 1954 were considerably higher than anticipated a year ago, according to Ross D. Siragusa, president, Admiral Corp., Chicago, Ill.

Siragusa believes industry television sales will be off slightly during 1955 to an anticipated but still healthy 6,500,000 sets, with color TV

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developing and growing slowly. (From 100,000 to 200,000 color sets may be sold during the year.)

Admiral plans additional plant expansion during 1955 and has five production facility projects on the drawing boards at present. In addition, new sales, service and warehouse facilities are being erected in several cities where company distributing branches are situated.

NEMA SALES FIGURES

FIRST 10 MONTHS OF 1954

Companies participating with the National Electrical Manufacturers Association have released the following summary of sales for October and the first ten months of 1954:

Electric ranges — October total 32,873; first ten months, 909,994.

Household refrigerators — October total 173,767; first ten months, 2,685,657.

Electric water heaters — October total 48,182; first ten months, 511,858.

Electric farm and home freezers — October total 52,004; first ten months, 568,185.

NEW SHIPMENT RECORD

SET BY GAS FURNACES

Edward R. Martin, Gas Appliance Manufacturers Association director of marketing and statistics, reported that the 71,700 gas-operated home heating furnace units shipped in November made it the third largest month in the industry's history and

brought the 11-month total to 609,500, exceeding the record set during the similar period in 1950.

November shipments were 66.5% over November, 1953.

3 MEN CONTROL THOR STOCK

It is reported that Arnold H. Maremont, president, Maremont Automotive Products, Inc., Victor Nemeroff, president, H. & B. American Machine Co., and David Bright, president, Electro Mfg. Co., have gained controlling stock in Thor Corp.

WESTINGHOUSE WASHER AND

DRYER SALES UP

Sales of Westinghouse automatic washers and electric dryers during the month of December hit an all-time high for any month in company history, it was reported by J. J. Anderson, manager of laundry equipment, Westinghouse Electric Appliance Div.

PERMAGLAS SHIPMENTS UP 25%

The Permaglas Div., A. O. Smith Corp., Kankakee, Ill., shipped almost 25% more water heaters in 1954 than in 1953. It was the best year in the division's history.

PEI MOVES TO NEW OFFICES

The Porcelain Enamel Institute has moved to new offices in the Associations Building, 1145 Nineteenth Street, N.W., Washington 6, D. C.

STEEL KITCHEN CABINET MFGRS.

HOLD QUARTERLY MEETING

The second annual National Steel Kitchen Cabinet Month officially was set for September, 1955, and plans for aggressive "promotion of the month" were initiated at the quarterly session of the Steel Kitchen Cabinet Manufacturers Assn. in Chicago.

Guest speakers at the meeting were George J. Pazik, president of the Milwaukee Appliance Dealers Assn., and Miss Bernice Strawn, household equipment editor of the Woman's Home Companion Magazine.

The next meeting will be held March 11, 1955, at the Waldorf Astoria Hotel, New York City. The annual meeting is scheduled for June 2-4, 1955, at The Greenbrier, White Sulphur Springs, W. Va.

MCGRAW BUYS COOLERATOR

It is reported that McGraw Electric Co., Elgin, Illinois, has purchased Coolerator Co., division of International Telephone & Telegraph Corp., Duluth.

The sale involves the current inventory of refrigerators and freezers, all machinery and fixtures and the Coolerator name.

JORDON COMPLETES '55 PLANS

Jordon Refrigerator Co., Philadelphia, Pa., has completed final plans for 1955 domestic line of upright home freezers and combination refrigerator-freezers, Harry Fogel, executive vice president, announced.

The 1955 lines will feature more

storage space in smaller size freezers and ultra-modern styling.

NORGE NAMES BIDDLE

SALES MANAGER OF DRYERS



Appointment of Hal L. Biddle as sales manager of automatic clothes dryers, a new position, has been announced by Norge Division, Borg-

Warner Corp., Chicago.

Biddle previously was vice president in charge of sales for Ironrite, Inc., Mt. Clemens, Mich.

INGERSOLL DIVISION TO EXPAND

Officials of the newly formed Ingersoll Conditioned Air Div., Borg-Warner Corp., Chicago, have announced plans for an immediate and major expansion of operations in the heating and air conditioning industries.

The plant in Kalamazoo, Michigan, will produce an entirely new line of gas-fired warm air furnaces.

WIENER, HOKIN BUY FEDERAL ENAMELING & STAMPING

Charles Wiener and Myron Hokin, Chicago and Detroit industrialists, have purchased the Federal Enameling & Stamping Div. of Follansbee Steel Corp., Pittsburgh.

Hokin is chairman of the board and Wiener is president of Detroit

PROBLEM:

How to make short work of a long finishing job

SOLUTION:

Install a Fostoria Radiant Oven

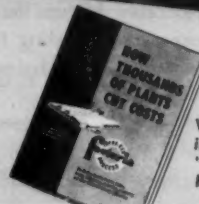
Fast? A Fostoria Radiant Oven heats at the speed of light . . . requires no warm-up . . . bakes out a finish in a fraction of the time required by convection ovens.

You save space—cut costs to the nub—improve product quality. Read the Tinnerman case history below.

- Cuts drying time 74%.
- Tinnerman Products, Inc. makes fasteners—by the millions.
- Before Fostoria was called in, they were finished in two fuel-fired batch ovens with great waste in time and motion.
- Two Fostoria Radiant Ovens cut drying time from 30 to 8 minutes—freed one worker for other tasks—improved work conditions.

Savings like this may be possible in your operation. Call your Fostoria Representative for the complete story.

THE FOSTORIA PRESSED STEEL CORPORATION, Dept. 220 Fostoria, Ohio



Write today for informative booklet, "How Thousands of Plants Cut Costs."

Brass & Malleable Co.

The purchased business will continue to be carried on in the name of Federal Enameling & Stamping Co., with principal offices and operations at McKees Rocks, Pennsylvania.

WALL HEADS NEW

SERVEL APPLIANCE DIVISION

John H. Wall, Evansville industrial executive, has been appointed to a



newly created key position at Servel, Inc., Evansville, Indiana, according to Louis Ruthenburg, board chairman, and Duncan C. Menzies, president.

Wall has been named general manager of the new self-contained home appliance division and a member of the executive committee. He was formerly vice-president for manufacturing, Kent Plastics Corp., Evansville.

DEEPFREEZE NAMES MILLER

Seth S. Miller has been named manager of operations for Deepfreeze Appliance Div., Motor Products Corp., Chicago, with overall responsibility for production, personnel and purchasing.

NOV. VACUUM SALES UP 10%

Sales of standard-size household vacuum cleaners in November aggregated 237,882, 9.6% below October and 10% higher than 216,227 sold in November, 1953, according to the

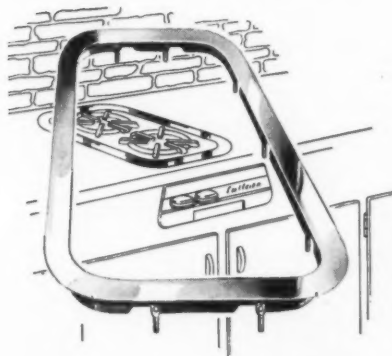
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*For the Built-In Oven
and the Drop-In
Cook Top...*

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FRAMES
AND
RIMS

Frames and rims are two items in the Pyramid line that will help you *step up sales* with *smarter appearance*. From lamp shades to kick plates, Pyramid specializes in sparkling stainless steel trim for modern appliances.



The latest trend in cooking appliances is the built-in oven and the drop-in cook top. If you're going after this market, you'll want to know about PYRAMID Stainless Steel FRAMES and RIMS ... Completely fabricated, ready to attach to your unit, they combine function with sparkling appearance designed to step up sales. Write for your copy of the Pyramid "Plan Book of Metal Mouldings" ... today!

Pyramid Mouldings Inc.

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SEND FOR YOUR FREE COPY OF "PLAN BOOK OF METAL MOULDINGS"

No one connected with the design or manufacture of any appliance should be without a copy of this book containing hundreds of standard and special mouldings. Send for your free copy today.

Without obligation, please send copy of
"Plan Book of Metal Mouldings." F-2

Name _____ Title _____

Firm _____

Address _____

Vacuum Cleaner Manufacturers' Association, Cleveland, Ohio.

COLLEGE BUILDING NAMED FOR WHIRLPOOL FOUNDER

A new science building for Kalamazoo College, Kalamazoo, Mich., will be named for the late Louis C. Upton, founder of Whirlpool Corp., it was announced by Weimer K. Hicks, president of the school.

The late Mr. Upton was a trustee of

the school for a number of years. His brother, Fred S. Upton, senior vice president of Whirlpool, is presently a member of the Kalamazoo College board of trustees.

AMERICAN KITCHENS UPS

BRINTNALL

Robert L. Brintnall, administrative assistant to the general sales manager, has been named midwest regional sales manager, announced C. Fred

Hastings, general sales manager, American Kitchens Div., Avco Mfg. Corp.

MCCRAY NAMES MATHIS

Glenn W. Mathis has been appointed chief refrigeration engineer for McCray Refrigerator Co., Inc., Kendallville, Ind., it was announced by G. K. Bently, vice president in charge of engineering.

BORG-WARNER DECLARES

DIVIDEND

Directors of Borg-Warner Corp. have declared a quarterly dividend of 42½ cents per share on common stock payable on March 2, 1955, to stockholders of record at the close of February 9.

INGERSOLL NAMES MCLARY

WORKS MANAGER

M. R. McLary has been appointed works manager, Ingersoll Products



Division of Borg-Warner Corp., Chicago, announced J. H. Ingersoll, president and general manager of the division.

McLary's previous Ingersoll appointments included chief engineer, director of engineering and research and factory manager.

G-E ELECTS THREE VPs

Election of three General Electric Co. vice presidents by the board of

ANNOUNCING...

The New WHIRLPOOL

Imperial Electric Clothes Dryer—

A combination of

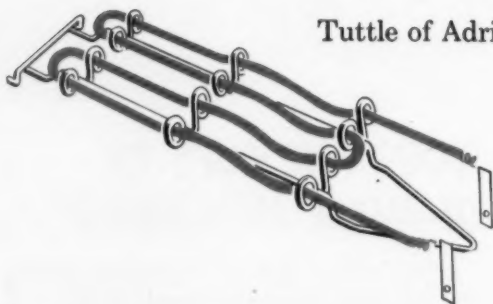
Style—Efficiency—and

Craftsmanship.



The WHIRLPOOL Imperial uses the
Nykelkrom V-Saddle Loop heating
element built by

Tuttle of Adrian.



H. W. Tuttle & Co.

ADRIAN, MICHIGAN

Manufactured and distributed in Canada by Macdonald Metals & Plastics, Ltd., Waterloo, Quebec



directors has been announced by president Ralph J. Cordiner.

Francis K. McCune is general manager of the atomic products Division. Robert L. Gibson is general manager of the chemical and metallurgical division, and Willard H. Sahloff is general manager of the small appliance division.

AMERICAN KITCHENS NAMES

JOHNS

Mack Johns, former eastern division sales manager of American Kit-



chens, has been named to the newly created post of sales manager of kitchens at American Kitchens Division, Avco Mfg. Corp., Connersville, Ind.

TENNEY ADMIRAL SALES MANAGER

Appointment of Jack Tenney as sales manager of the refrigeration division, Admiral Corp., Chicago, has been announced by W. C. Johnson, vice president sales. Tenney replaces Joseph P. Halpin, who has resigned.

Tenney was formerly national sales manager of Norge div., Borg-Warner Corp.

NORGE ANNOUNCES DEALER

PROFIT-SHARING PLAN

A plan which pays dealers an additional profit for every appliance purchased was disclosed to a closed meeting of nearly 1,000 national Norge distributor personnel by Norge president, Judson S. Sayre.

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NICKELOID METALS



look good from any angle

Whether you're angling for a new product design, re-designing an established product, or casting for fresh design ideas for a functional part or decorative trim . . . take a good look at Nickeloid pre-plated Metals. Reflected in their gleaming, durable finishes of chrome, nickel, copper and brass you will find a whole new realm of exciting design possibilities. You will find, too, many design success stories which resulted when Nickeloid Metals were considered in the *pre-design* stage, to take *full* advantage of their versatility and their lower production cost.



DESIGN



PRODUCTION



SALES



Free Booklet — 24 pages of illustrations and data covering properties, uses and fabrication techniques for Nickeloid Metals. Get yours today!

Sales Offices in Most Principal Cities

NICKELOID METALS
SINCE 1900



**AMERICAN
NICKELOID
COMPANY**
PERU 11, ILLINOIS

Under the plan Norge will save for the dealer's account 2% of the cost of each Norge appliance bought from an authorized Norge distributor between Jan. 1 and June 30, 1955. Payment will be made to the dealer in one check shortly after June 30.

1955 INDUSTRIAL FINISHING EXPOSITION IN CLEVELAND

Cleveland will be the site of the 1955 Industrial Finishing Exposition.

The show is to be held in the Cleveland Public Auditorium on June 20 — 23 in conjunction with the 42nd Annual Convention of the American Electroplaters' Society.

FOUR BETTINGER PLANTS REPORT BUSINESS BACKLOG

A 20% increase in his company's business for 1955 was predicted by Robert A. Weaver, Jr., president, Bettinger Corp., Waltham, Mass.

In a recent directors' meeting, Weaver stated that porcelain enamel is on the brink of a major renaissance in its many-thousand-year history. "The increased uses of porcelain enamel in two major fields, architectural and industrial, will account for the increase in our sales".

All of the four plants producing Bettinger products — the home plant, the Porcelain Enamel Products Corp., Rehoboth, Mass. (subsidiary), the Toledo Porcelain Enamel Products Corp., Ohio (wholly-owned subsidiary) and Graham Bell Ltd., Streetsville, Ontario, — are operating at a highly satisfactory rate with a substantial backlog of business, said Weaver.



COLORFUL *vitreous enameled* ALUMINUM can help you make a faster-selling product


There's nothing like *vitreous color* on lightweight aluminum to make your product sell faster!

Du Pont Vitreous Enamel for Aluminum provides coatings in a wide range of colors and surface textures . . . gives aluminum products durable finishes that resist abrasion, thermal shock, impact and flexing.

Vitreous enameled aluminum can be sawed, sheared, drilled and punched without spalling, and because these rugged coatings add rigidity to aluminum sheet, you can use lighter gauge aluminum . . . cut your packaging and shipping costs.

We can put you in touch with experienced aluminum enamelers.

For more information just check coupon below.

<p>DU PONT VITREOUS ENAMEL FOR ALUMINUM</p> <p></p> <p>Better Things for Better Living ... Through Chemistry</p>	<p>E. I. du Pont de Nemours & Co. (Inc.) Electrochemicals Dept. F255, Wilmington 98, Del.</p> <p><input type="checkbox"/> Please send me your illustrated folder on Vitreous Enamel for Aluminum.</p> <p><input type="checkbox"/> Please have an experienced enameler contact me.</p> <p>Name _____</p> <p>Firm _____ Position _____</p> <p>Address _____</p> <p>City _____ State _____</p>
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WASHER SALES UP 29.5%

Factory sales of standard-size household washers in November totalled 308,368 units, down 9.1% from October and up 29.5% from November, 1953, according to Guenther Baumgart, executive director of the American Home Laundry Manufacturers' Association.

Sales of automatic tumbler dryers were 13.2% over October and 76.9% over November, 1953.

Ironer sales were 28.8% below October and 36.4% below November, 1953.

AHLMA ELECTS HANK

Bernard J. Hank, president, Conlon-Moore Corp., Chicago, has been elected a member of the executive committee of the American Home Laundry Manufacturers' Association and vice chairman of its ironer division.

WILSON TO HEAD RWMA

J. C. Wilson, Jr., president, Acro Welder Mfg. Co., Milwaukee, Wisconsin, was elected president of the Resistance Welder Manufacturers' Association at their annual meeting in Detroit.

He served during 1954 as vice president and has been active in connection with work done by the technical committee.

NEWCOMB-DETROIT

PIONEERS IN ENGINEERING,
MANUFACTURING & INSTALLING OF



**INDUSTRIAL
OVENS**
•
SPRAY BOOTHS
•
PARTS WASHERS
•
DUST COLLECTORS
•
**HEAT
and AIR
SYSTEMS**

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★ A Motor for LOW SPEED OPERATION



If you are now manufacturing a product or developing a product where you need motion at slow speed, here is the motor for you. Hundreds of thousands now in use on cooking appliances, vending, coin operated, amusement, and advertising displays.

These AC gear motors are precision built and are being manufactured in volume for immediate delivery. For further information, send the requirements of your application to us. Special motors are built to meet your new product needs. Write today for data sheet.

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1600 JUNCTION AVENUE
RACINE, WISCONSIN

Designers and Manufacturers of
SPECIAL INDUCTION MOTORS

PEI SCHEDULES WEST COAST MEETING

The Porcelain Enamel Institute has announced that Los Angeles, Calif., will be the scene of an important industry meeting, March 10-11.

The purpose of the meeting, according to John C. Oliver, PEI secretary, is to build closer liaison between West Coast enameling industry and the companies in the eastern and central part of the United States, and to give western representatives a first hand report on PEI activities being carried on for the benefit of the entire porcelain enameling industry.

Plans have been formulated for a joint meeting one evening with the Pacific Coast Enamellers Club.

METAL STAMPERS SPRING TECHNICAL MEETING

Warren Peterson, chairman of the Pressed Metal Institute's Technical Research and Standards Committee, and president of Peterson Products, Inc., Chicago, has announced the subjects to be covered in PMI's 6th annual Spring Technical Meeting. The meeting will be held March 16-18 at the Hotel Carter, Cleveland, Ohio. Conference theme is "The Inside Story of Metal Stampings."

Session topics will include the following: "Safety Doesn't Cost — It Pays", "Securing an Estimate and Estimating a Stamping Job", "Running a Stamping Job", and "New Techniques and Developments as Related to the Stamping Industry."

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APPLIANCE INDUSTRY**

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INTEGRATED COMPANIES
BARIUM
STEEL CORPORATION
MAKERS OF
STEEL SPRINGS
MAGNETIC FILMSTRIPS

SPRINGS and
STAMPINGS
STUD CLIPS
SCREW FASTENERS
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THREADED FORMS
SPECIAL COLD HEADINGS
In all Metals!

Contact your Cuyahoga representative

The CUYAHOGA SPRING Co.
SUBSIDIARY OF THE BARIUM STEEL CORP.
10234 BEREA ROAD • CLEVELAND 3, OHIO

NEMA outlook

→ from Page 27

Increased home construction and modernization expected during 1955 should bring about a substantial increase in the basic household appliances . . .

Trend to larger appliances

Also, the trend toward larger models of appliances in evidence during the past few years will, undoubtedly, help to stimulate the buying of Refrigerators, Freezers and Water Heaters. Home Freezers of 13 cubic feet and over accounted for only 11% of the total shipments of 1947 and by 1952 this had increased to 55% and by 1954 to 68%.

In 1948 the 9 cubic feet and over size of Household Electric Refrigerators comprised 28% of the total shipments, and by 1954 this had increased to 66%.

Since 1947 the shipments of Water Heaters of 55 and over gallons has increased more than 3%, while the Water Heaters of 34 gallons or less has decreased 2%.

However, Electric Ranges seem to be moving in another pattern, since the comparative figures of 1954 and 1953 show that Electric Ranges of 22 to 31 inches have increased approximately 5%, while the Ranges under 22 inches (apartment house size) and those over 32 inches have decreased about 5%.

Illuminating equipment is expected to continue its trend upward with sales for 1955 estimated at 1% higher than in 1954.

Shipments of electrical building equipment and supplies are expected to increase 3% over last year.

An optimistic picture

Thus, the electrical manufacturing industry is adding its feeling of optimism to the business picture for 1955. Involved as it is directly with the development of new products, new processes and continued modernization of homes, factories, commercial establishments, hospitals, public buildings, etc., and involved as it is in the development of and the utilization of atomic energy, there is good reason to believe that the industry

will attain its goal in 1955 and establish new levels of activity in subsequent years.

GAMA outlook

→ from Page 26

which will be accomplished within this framework can reap additional benefits through utilization and expansion of their own assets.

First, the year ahead will present design and performance improvements in kitchen appliances.

Second, technological advances will be noted throughout the gas appliance and equipment manufacturing industry.

Third, the public relations program, sponsored by GAMA, is in full swing, and will reap the additional benefits of three years' experience.

Fourth, the Action Program for Gas Industry development has been proved a practical and workable instrument. This proof has been provided by the progress of its field testing in the Ten Demonstration Cities, which results provide evidence that the sale of gas appliances and equipment can be brought into favorable focus with the sales potential of a gas utility's franchise area.

Fifth, individual manufacturer promotional and sales efforts will, in all probability, be in tune with their improved designs and in line with the

to Page 152 →

INDUSTRY NEWS

COLEMAN NAMES ALBRIGHT

It is reported that Douglas C. Albright has been appointed director of manufacturing, Coleman Co., Inc., Wichita, Kansas.

G-E ESTABLISHES PURCHASING TRAINING COURSE

General Electric Co., Schenectady, N. Y., has announced a company-wide purchasing training course as a step toward manpower development to meet anticipated growth in the electrical industry.

C. Willard Bryant, manager, ma-

terial service department, has announced that James A. McAleer, manager of purchasing research services, will coordinate the program with Douglas V. Smith as specialist in charge of purchasing training.

NORGE NAMES MCINTOSH SALES MANAGER, CONVENTIONAL WASHERS

R. F. McIntosh has been appointed sales manager of conventional wash-



ers by Norge Division, Borg-Warner Corp., Chicago.

McIntosh was previously vice president of sales and merchandising for Woman's Friend conventional washer, Findlay, Ohio.

AMANA TO INCREASE PRODUCTION OF FREEZERS, ROOM AIR CONDITIONERS

Amana Refrigeration, Inc., Amana, Iowa, plans to substantially increase freezer production in 1955.

George C. Foerstner, executive vice president, also reported that production of room air conditioners will double during 1955.

He spoke at a reception for the press held at the Conrad Hilton Hotel, Chicago, in conjunction with the Winter Home Furnishings Market.

William F. Zarbaugh is reported to have been appointed vice president of The Cold Metal Products Co., Youngstown, Ohio.

Guideposts in producing hot water tanks

→ from Page 40

and is included in all enameling operations.

Types of steel

At the present time no great emphasis has been placed upon the requirements of steel for the enameling of water heaters other than those initially used by the industry for galvanizing. Hot rolled steel has been used successfully up to the present time with some few instances in which trouble has been encountered. It should be noted that some annealing results from the enameling fire and that steel of slightly heavier gauge than that used for galvanizing is desirable. Some emphasis is also being placed upon slightly higher carbon contents to gain strength. The use of premium grade iron has not received much consideration up to the present time because of its cost and the competitive character of this market. Slag and scale inclusions, as well as laminated steel must be eliminated. It is also necessary to avoid contact with and contamination by other metals—such as lead, zinc and aluminum—prior to the enameling.

Metal preparation

Because of the metal used and the character of the fabricating operations, blasting methods for cleaning the metal are recommended. Blasting methods can be either of the air or centrifugal type; sand, shot or grit is commonly used. The selection of a satisfactory grit or shot is important. Better cleaning of the welds is obtained and heavily scaled and burnt areas are easily cleaned, leaving an etched surface which is conducive to the best enameling and enamel adherence.

A new material called "Mineral Shot," developed as a by-product of the rock wool industry, has recently been released by the Navy Department for industrial use. Formerly, it was used exclusively by the Navy in shipyards. Experience with this material at the present time is limited but a study of the sales literature gives some basis to the opinion that it may be valuable in that it does not

finish FEBRUARY • 1955

LOOK TO DETREX FOR



on **YOUR** product. . . . a
**PEDIGREE FOR
PAINTED PARTS**

Put this Detrex Paintbond label* on your product and increase its sales appeal. To your customers it indicates added value and a quality product throughout. Production-wise you'll benefit, too. Paintbond is easy to apply, positively seals metal against moisture and corrosion, improves finishes and is more economical to use. For complete details, send for free Paintbond booklet.

**Labels furnished free in handy dispensers to Paintbond users.*

Please send us complete facts about Paintbond and how it will improve our finishes while cutting our costs.

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
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DETREX

CORPORATION

DEPT. PB-307 BOX 501, DETROIT 32, MICH.

leave a smudge coat on the ware; claims are also made for reduction in maintenance costs. At the present time, speed of cleaning as compared to shot and grit remains to be determined. It is, however, known that in de-enameling air pressures have been reduced from 90 pounds to 45 and orifice openings doubled as compared to those used for a sand and grit combination.

As indicated in the introduction, the requirements of coatings for hot water tanks are most stringent and past experience has shown that ordinary enamels, or those not passing all known simulated service tests, lead to failure in the field. In order to compete with the price of galvanizing, water resistant qualities have been incorporated into special enamels which can be applied in one coat. It is hoped that the quality development committee of the PEI will soon make their recommendation of a test, or series of tests, which can be properly used to evaluate those qualities which should be present in an enamel to meet the requirements of the water heater industry. The use of such a test and continued development of enamel formulation based on actual field experience is an absolute necessity in the successful continued development of this market.

Enameling procedures

The shell or shell head assembly can be coated by flow coating, a combination of flow coating and slushing or spraying. In general, the spray method, either by hand or with automatic equipment, is preferred. The base flue assembly and separate heads are usually enameled by spraying either by hand or automatically. Flow coating is occasionally used by allowing the enamel to flow over the rotating base and flue. Sufficient enamel is applied in all cases so as to give a uniform coating, free from heavy beads or thin areas, with a minimum average coating of 5 thousandths. Actually, the average thickness of one coat approximates 7 thousandths. This figure will vary according to the manufacturer but the above figures constitute a good standard.

Drying—The drying operation presents no great problem in the manufacture of water heaters providing care is taken to insure proper circulation within the shell head assembly. This is accomplished by directing heated air into the open end of the shell. It might be mentioned here that this is one of the greatest deterrents to those manufacturers wishing to enamel a closed vessel in which both ends are welded into place prior to enameling, or two hemispheres

welded together prior to enameling. Some success has been accomplished in this field by the use of chemical drying rather than drying by heat, but the problems imposed by proper firing, inspection and reoperation do not permit any consideration at all being given to the adoption of such design.

Firing—Recognizing the fact that we are firing gauge ware of dissimilar thicknesses using hot rolled steel and desiring to obtain a finish as impervious to water penetration as is economically possible, due attention must be directed to the firing of this type ware. For that reason it is recommended that enamel thicknesses heavier than normal be used and that ample time be given to the firing cycle to permit the metal to gas out and the enamel to properly fire. The application of thin coatings and rapid firing at elevated temperatures is definitely not recommended.

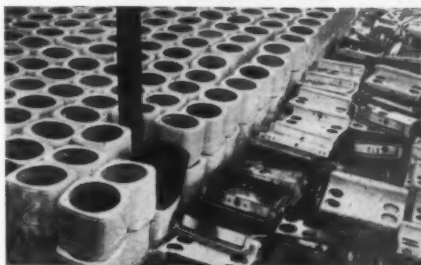
Inspection—The old story of overdoing a good thing should be kept in mind when inspecting finished ware. This, of course, refers to the use of the magnesium anode and the feeling that if it can protect a little exposed metal it can also protect a lot. Thus it is easy to adopt a devil-may-care attitude and get 100% ware in one coat. However, such an attitude is definitely not recommended. The anode should be considered as being placed there to protect necessary assembly welds and an occasional pinhole or blister. Anode protection is also necessary in those areas adjacent to the connections. The A. O. Smith paper (previously mentioned) gave an estimated area of 3 square inches of weld metal being exposed in the design they were then using. This figure might be used as a criterion in publishing any inspection standards. Burned-off areas of appreciable size and less than 3 mil thicknesses should be avoided. With the utilization of the proper enameling techniques, correct enamel and firing techniques, acceptance figures in excess of 95% good quality in one coat should be obtainable.

Seaporcel Metals, Inc. — announced it has gone into the manufacture of porcelain enamel on aluminum at its Long Island City plant. The company formerly confined production to porcelain enamel on steel. M. Jesse Salton, president, said the new aluminum process "means a weight reduction of as much as two-thirds compared with ceramic-coated steel. The initial order was said to be a Navy job."





DEFECTIVE PLUMBING-WARE



DEFECTIVE WASHERS AND RANGE TOPS



THE CAUSTIC BATH



THE WASH-OFF



SANDBLASTING

D-ENAMELING has saved over 30,000 tons of fabricated steel parts

SINCE D-Enameling became a permanent part of the appliance manufacturing picture over 30,000 tons of steel which otherwise would have been complete loss have been saved from the scrap pile . . . re-enamelled . . . transformed into first class salable condition. It isn't just the steel that's been saved though — it's thousands of dollars, too!

D-Enameling has made it possible for one range manufacturer alone to save as much as 50% of the original cost of range tops. In plant after plant the story of savings resulting from D-Enameling is similar. Is it any wonder why so many manufacturers of ranges, refrigerators, washers, driers, sinks and bathtubs now transform their defective parts and products into profit through D-Enameling?

If you're really interested in cutting costs, it will pay you to get all the facts about D-Enameling now. You'll be agreeably surprised how much the simple economics of D-Enameling can benefit you.

May we discuss this soon?

THESE INDUSTRY LEADERS KNOW FROM EXPERIENCE THAT D-ENAMELING TRANSFORMS SCRAP LOSS INTO PROFIT DOLLARS

ARROW SIGN CO. • BRIGGS MANUFACTURING COMPANY • CAPITAL AIR-
LINES • CHALLENGE STAMPING & PORCELAIN CO. • CLEVELAND-TENNESSEE
ENAMEL COMPANY • CLYDE PORCELAIN STEEL DIV. • CONLON-MOORE COR-
PORATION • CRIBBEN AND SEXTON COMPANY • CROWN STOVE WORKS •
DWYER PRODUCTS CORPORATION • ESTATE HEATROLA DIVISION • FLORENCE
STOVE COMPANY, Kankakee • GENERAL PORCELAIN ENAMELING AND MANU-
FACTURING COMPANY • GIBSON REFRIGERATOR COMPANY • GLOBE AMERI-
CAN CORPORATION • GRAY & DUDLEY CO. • ICE COOLING APPLIANCE
CORPORATION • A. J. LINDEMANN & HOVERSON COMPANY • MAGIC CHEF
INC. • MALLEABLE IRON RANGE COMPANY • MAYTAG CO. • NORGE DIVISION,
Effingham • NORGE DIVISION, Muskegon Heights • PRENTISS WABERS PRODUCTS
CO. • GEO. D. ROPER CORPORATION • RHEEM MANUFACTURING CO. • SAMUEL
STAMPING & ENAMELING CO. • A. O. SMITH CO. • THE ENAMEL PRODUCTS
COMPANY • THOR CORPORATION • TYLER FIXTURE CORPORATION, Waxahachie.

New Process D-Enameling Corp.

Highland and New Haven Avenues • Aurora, Illinois

NEWS ABOUT SUPPLIERS

BINKS SPRAY PAINTING SCHOOL

The second class of the winter session of the Binks Mfg. Co.'s free School of Spray Painting will be held at the Chicago plant February 7-11.

The dates for the remainder of the session are March 7-11 and April 4-8.

The school is open to anyone interested in, or connected with, the industrial application of paint and coatings.

VITRO ELECTS TOWNSEND

DIRECTOR

Morris M. Townsend has been elected a director of Vitro Corp. of America, New York City, according to J. Carlton Ward, Jr., president. On the Vitro board he replaces William B. Paul, who resigned.

TRANTER NAMES 2 DIRECTORS

John Seaman and Robert E. Jaqua have been elected to the board of directors of Tranter Mfg. Inc., Lansing, Michigan.

Seaman is from the law firm of MacLean and Seaman, and Jaqua is

executive vice president of The Jaqua Co., advertising agency.

Re-elected board members are: James R. Tranter, company president, John H. Flewelling, treasurer, and Albert G. Redmond.

At the board meeting Tranter reported that net sales for 1954 totalled \$7,356,598.

AMERICAN THERMOMETER

APPOINTS SEGUIN

Appointment of Carl Seguin as process engineer in charge of cost reduction has been announced by American Thermometer Div., Robertshaw-Fulton Controls Co.

American Thermometer Div. manufactures automatic control devices for home appliances and industrial applications.

NEW PEMCO AD MANAGER

Thomas S. Hook, formerly in charge of publicity and on the advertising staff of The Black & Decker Mfg. Co., has been named advertising manager, Pemco Corp., Baltimore, Maryland, it was announced by W. Russell Greer, Pemco vice president.

THOMPSON TO AMERICAN

ROCK WOOL

Ralph M. Thompson, formerly appliance insulation specialist, Owens-Corning Fiberglas Corp., Chicago, has joined American Rock Wool Corp., Chicago, in the capacity of assistant manager, industrial products.

U. S. STEEL UPS

DARBY AND AURELIUS

J. Douglas Darby has been appointed assistant executive vice president — commercial, of the United States Steel Corp., Pittsburgh, Pa., it was announced by David F. Austin, executive vice president.

Succeeding Darby as vice president and general manager of sales will be Marcus J. Aurelius, vice president of sales, United States Steel, Columbia-Geneva Div.

FEDERAL MACH. NAMES KEY MEN

It is reported that Hoyt Ammidon and J. R. Barefoot have been elected directors of the Federal Machine and Welder Co., Warren, Ohio.

A. S. Blagden has been re-elected president.

CREAN NEW PRESIDENT

OF REFLECTAL CORP.

R. B. Crean has been elected president of Reflectal Corp., a subsidiary of Borg-Warner Corp.

He is also vice president and assistant general manager of the Ingersoll Products, Ingersoll Kalamazoo and Ingersoll Conditioned Air divisions.

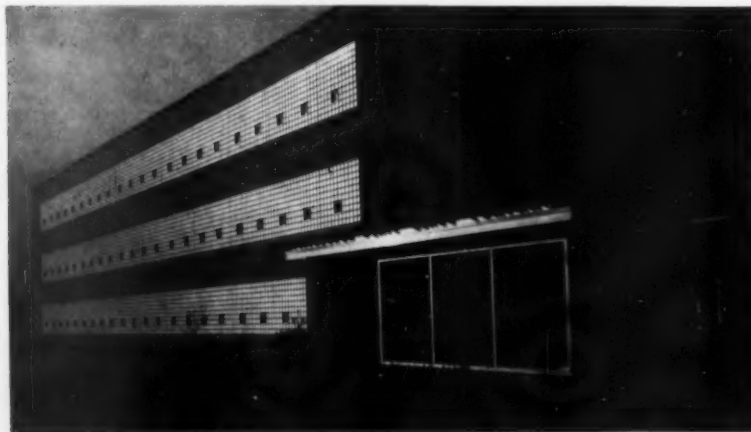
He succeeds R. S. Ingersoll, administrative vice president of Reflectal.

G-E AND TELECHRON CLOCK

SALES FORCES COMBINE

The sales forces of General Electric clocks and Telechron clocks, formerly parallel setups, have reportedly combined into a single selling organization. Advertising for the two brands will be combined, and

Pittsburgh Plate Glass — A new structure housing the basic and applied research laboratories of Pittsburgh Plate Glass Company's paint and brush division has been officially opened at Springdale, Pa. Formerly basic and applied paint and plastics research operations were located at Milwaukee, Wisconsin.



clock dials will be redesigned to feature both the G-E and Telechron brand names. G-E is planning what it calls "the greatest electric clock promotion in 30 years."

ALUMINUM INDUSTRIES NAMES 2 VICE PRESIDENTS

Aluminum Industries, Inc., Cincinnati, Ohio, has elected Randolph J. Roshirt executive president of the company and R. Vain Bowman vice president of the Permite paint division.

CLARK VP OF BORG-WARNER DIV.

Edward W. Clark, works manager, Calumet Steel Div., Borg-Warner Corp., Chicago Heights, Ill., has been elected a vice president of the division, it was announced by W. B. Caldwell, president, Calumet Steel.

CHAPPUIS TO HEAD BETTINGER SUBSIDIARY

Sylvan F. Chappuis has been named president of the Toledo Porcelain Enamel Products Co., Toledo, Ohio, a wholly-owned subsidiary of the Bettinger Corp., Waltham, Mass., announced Robert A. Weaver, Jr., Bettinger president.

HOMMEL APPOINTMENTS

Dr. John E. Cox has been appointed senior fellow on the ceramic chemicals fellowship which has been maintained by The O. Hommel Co. at Mellon Institute since 1933.

He joined Hommel from the research laboratories of New Jersey Zinc Co.

Hubert D. Jackson has been appointed sales and service engineer at Hommel to assist Blair McCon-

naughey in the Ohio, Indiana and Kentucky territory, according to Ernest M. Hommel, president.

DAWSON TO FERRO BOARD

The election of James M. Dawson, vice president and economist, National City Bank of Cleveland, to the board of directors, Ferro Corp., Cleveland, Ohio, has been announced by Robert A. Weaver, chairman of the board. Dawson succeeds Allen L. Billingsley, deceased.

STEWART-WARNER NAMES KEVITT AND WICKLATZ

Appointment of Leo J. Kevitt as manager of manufacturing, Alemite lubrication equipment and Stewart-Warner instrument division, Stewart-Warner Corp., and of Edward G. Wicklatz as manager of Alemite and instrument engineering, have been announced by F. A. Hiter, senior vice president and head of the division.

'54 BEST YEAR FOR FERRO SALES

Consolidated sales of the Ferro Corp., Cleveland, Ohio, for the year 1954 are expected to reach a record breaking estimated \$42,000,000, according to Robert A. Weaver, chairman.

Profits per share may amount to approximately \$2.95.

VOKOLEK NAMED V P BORG-WARNER DIVISION

The naming of William C. Vokolek as vice president and works manager of the Franklin Steel Div., Borg-Warner Corp., Franklin, Pa., has been announced by W. B. Caldwell, divisional president.



HUBERT D. JACKSON



DR. JOHN E. COX

HERCULES POWDER DECLARES DIVIDEND

The board of directors, Hercules Powder Co., Wilmington, Delaware, has declared a regular quarterly dividend of 1¼%, equal to \$1.25 a share on its preferred stock.

KAISER ALUMINUM NAMES MAIER

Kaiser Aluminum & Chemical Sales, Inc., has announced the appointment of Cornell C. Maier as assistant product manager for aluminum rod, bar and wire products.

BEHR-MANNING NAMES EVANS AND CLARK

Elmer G. Schacht, president, Behr-Manning Corp., Troy, N. Y., has announced the appointments of Edwin C. Evans as vice president and general manager, and William I. Clark, Jr. as assistant to the president.

JOHNSON HEADS REFRIGERATION SALES FOR HOUDAILLE-HERSHEY

Russell A. Johnson has been named sales manager of the refrigeration components division of Houdaille-Hershey Corp., and will headquarter in North Chicago, Ill., where the division is located. The announcement was made by Eric Boehm, newly-appointed division manager.

WILLIAM I. CLARK, JR.



RALPH M. THOMPSON



JAMES M. DAWSON



RUSSELL A. JOHNSON



EDWIN C. EVANS



THOMAS S. HOOK



finish SUGGESTION BOX



Portable "fire gun" for brazing, pre-heating, soldering, paint removal

THE "fire gun", a new portable hand-operated heat tool, burns low-cost propane with a heat range of 4,000 to 117,000 Btu per hour. It is available for small or large heating applications that are within or beyond the capacity of conventional blow torches or soldering irons.

Trigger controlled, the device is suited for a multitude of heat uses, such as soldering, tinning, brazing, pre-heating, thawing, plasticizing and paint removal.

The 3650° F. flame of the new heat tool burns clean with no carbon deposit or "blackened area" because

the burner tips are designed to give complete combustion of the propane using oxygen from the air. The "fire gun" operates at about 1/10th the cost of an acetylene torch for the same amount of heat.

A basic "fire gun" kit includes a heat concentrator tip, a high heat or blow torch tip, a soldering iron tip which is equivalent to a 12 lb. commercial iron, hose, regulator, pressure gauge, and steel carrying box.

Source for further information on this new heat tool may be obtained by writing to **finish**.

Home laundry outlook

→ from Page 31

cases to thwart various proposals for the increase of freight rates. In other cases, he declared, "we have been able to negotiate for lower rates whenever it seemed advisable to do so. Advance planning and scheduling pay big dividends in keeping down transportation costs, but the necessity for paying higher rates seems to be always with us, and in too many cases."

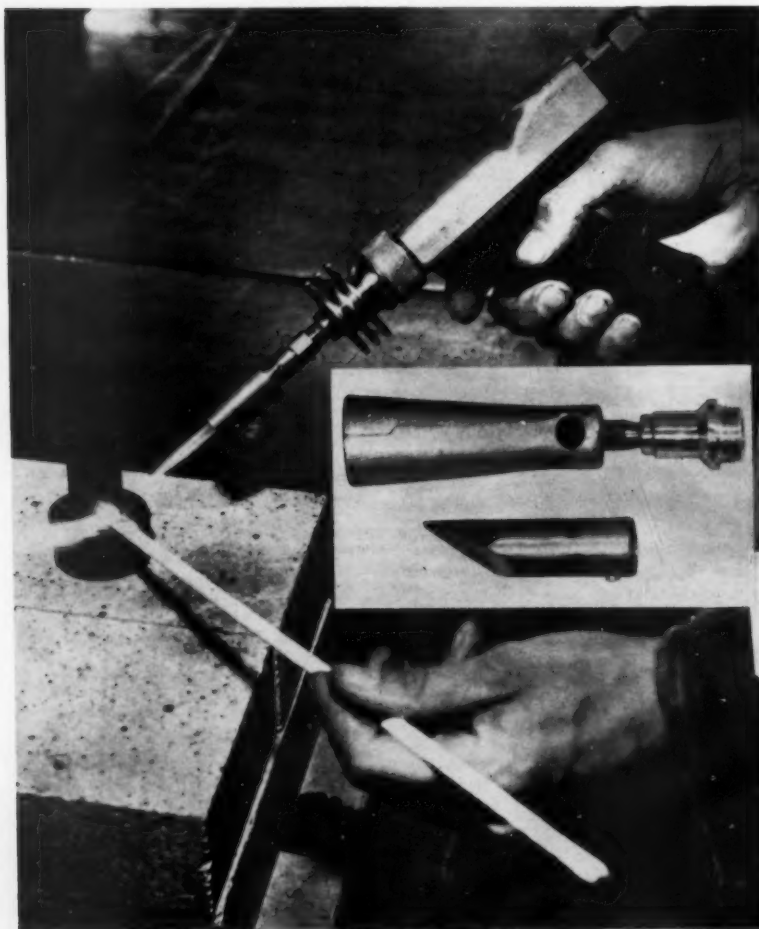
Emphasizing the immensity of the problem continually facing traffic experts, Carr pointed out that "there are 30,000 important shipping points between which freight rates are published in thousands of separate tariff publications."


Intra-state taxes

affect nationwide distribution

Taxes imposed upon industry and business in many states are becoming a serious detriment to distribution on a nationwide basis, John M. Wicht, chairman of AHLMA's government committee, and vice president of Blackstone Corp., Jamestown, N. Y.

"Companies find it harder and harder to maintain the national expansion which is necessary to their future," he said. "Too many states are building the proverbial Chinese Wall along their boundaries, with steadily mounting intra-state taxes which do nothing but serve as a barrier of unfairness and inequality between them."





February • 1955

safe transit

FROM ASSEMBLY LINE TO FINAL CUSTOMER



THE RIGHT START



At that moment, when the new product is ready for launching, you're glad to know that it is starting out right in containers which guard against damage all the way. Developed with the same care as you give your product, Gaylord Boxes combine proved design with quality board to give you superior protection.

You owe it to yourself—and to your products, new or old—to investigate Gaylord Boxes. Call your nearby sales office.

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

ST-2

FEBRUARY • 1955 finish

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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Signode unitizing method speeds truck handling of heavy castings

A manufacturer in Alabama sought a safer, lower cost way to ship heavy-wheel castings by motor truck to Michigan. With the co-operation of Signode's fieldman, a special unitizing pallet pack was developed. First, a heavier, stronger pallet was built. Two layers of castings, separated by a wood frame, and similarly capped, were strapped to the pallet. Six bands of Signode steel strapping, spaced for maximum unitizing efficiency, were applied. The new method of shipping saved time in loading and unloading. Handling safety was greatly increased. Cost of the pallets was self-liquidating, because the receiver bought them for inplant handling and storing of castings, and for intraplant shipping.

Get in touch with your Signode Fieldman! He will be able to show you, too, how to make important savings in packaging, handling and shipping your products through the six basic unitizing methods. Quickest way to reach him is to write

SIGNODE Steel Strapping Co.

2639 N. Western Ave., Chicago 47, Ill.

Offices coast to coast—Foreign subsidiaries and distributors world-wide.
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

CHICAGO MILL helps NORGE *Deliver Safely*



**NORGE REFRIGERATORS ON THE PACKAGING
LINE AT THE MUSKEGON HEIGHTS PLANT.**

Norge Division, Borg-Warner Corporation, and many other leading appliance manufacturers depend upon Chicago Mill and Lumber Company to provide safe shipment for their finished products.

If you are having difficulty in solving a troublesome shipping problem, call in a Chicago Mill representative. Technical information, packing information, and testing services are available without obligation.

Wirebound
Nailed or Hinge Corner
Cleated Plywood
Cleated Craveneer
Cleated Corrugated
Watkins Type Containers
Shop and Tote Boxes
Woodsteel Nesting Boxes

★
FOR DOMESTIC OR EXPORT
FOR PEACE OR DEFENSE

**A shipping container for
every shipping purpose**

FOR SAFER TRANSIT BY •  TRUCK •  BOAT •  TRAIN •  PLANE

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street

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Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois

What the laboratories say about National Safe Transit

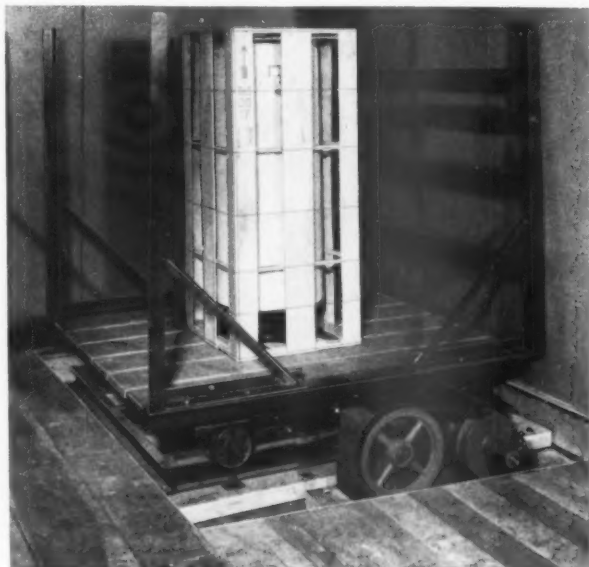
IN the January issue, in an article entitled "*The Safe Transit Laboratory Helps You Help Yourself*," F. A. Petersen stated that the certified Safe Transit laboratories have always filled an important role in the Safe Transit educational field. Petersen, of Hunter & Thomas Asso-

ciates, is chairman of the Laboratory Coordinating Division of the National Safe Transit Committee.

Petersen went on to say that the laboratories themselves claim their testimonials "as their best work in the field of education . . . The Safe Transit Laboratory has removed the

blindfold from the shipper's eyes."

The article was accompanied by comments from eight certified laboratories. This issue contains comments from nine more laboratories. Additional comments will be published as received.



Rathborne, Hair & Ridgway Box Co.

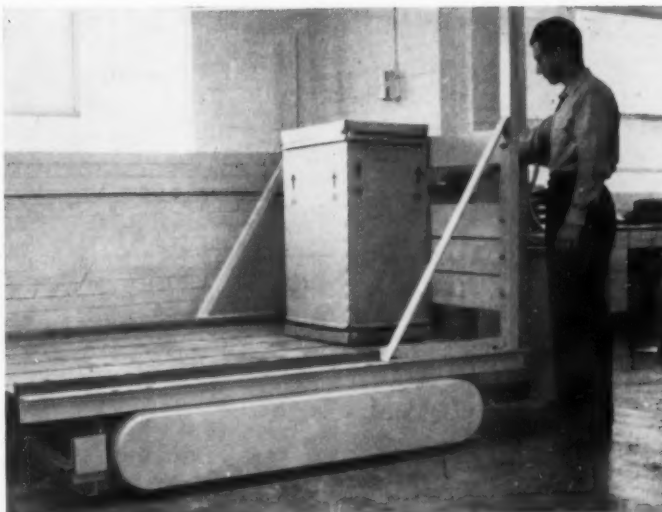
"Since instituting the NST program in our laboratory, we have definitely been able to use the old adage — 'seeing is believing'. It is sometimes difficult to convince customers to change from the old way of packaging to something different or new. With the help of the NST controlled series of tests, simulating actual shipping hazards, the customer has no doubt as to the acceptability of a new or different container or method of packing. We think very highly of the complete program and feel fortunate to be able to offer this pre-shipment testing to our customers or prospects."

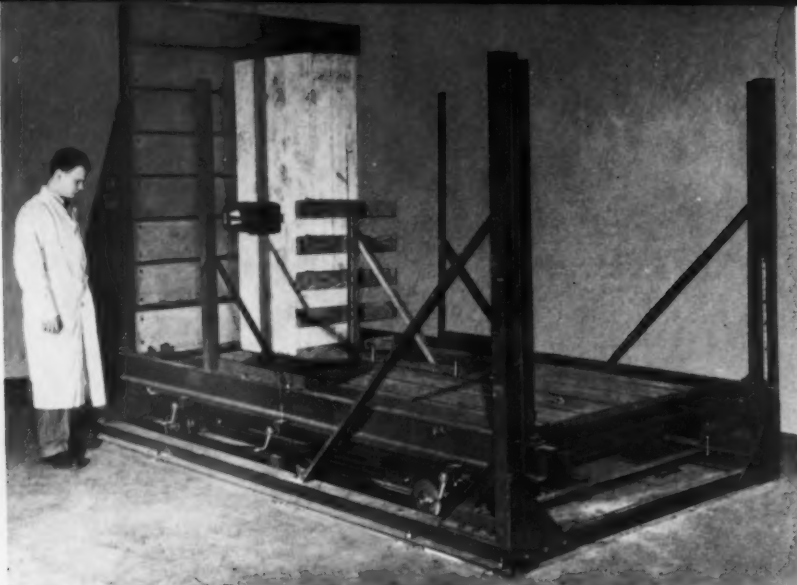
F. E. Bristol
Chicago, Illinois

Highland Box Company

"We felt that a program, such as the National Safe Transit Committee is promoting, would provide an added service to our customers and were eager to fully equip our laboratory and receive recognition as a certified laboratory. We are proud to be a member, and, although new in the organization, we are sure we will be called upon to assist in developing safe transit packages."

Karl H. Rennie
Highland, Illinois





United States Testing Co., Inc.

"As an independent testing laboratory, the installation of pre-shipment testing equipment and the use of the NST program has expanded our facilities into another service for our clients. Along with the services we offer for the evaluation of products and materials, our clients may now determine whether the product will arrive in good condition at its destination. The packaging problem should not be overlooked in product evaluation."

Charles J. Kleissler
Hoboken, New Jersey

International Paper Company

"The National Safe Transit Program has met with approval everywhere. Our reaction to the NST program can best be demonstrated by the fact that we have established a number of Safe Transit laboratories from coast to coast so that we will be in a position at all times to render prompt and complete laboratory testing service to our customers and friends."

W. A. Von Hagen
New York, N. Y.



Package Research Laboratory

"The NST program is a vital part of our laboratory procedures. It is used to check all packages designed by ourselves or submitted by others. Experienced and novice designers both profit from the program since the results are objective."

"We have had numerous articles shaken apart in minutes, and in one instance, 15 seconds. Inadequate spot welds, self-tapping screws and missing washers are frequent causes of early failure on vibration table."

"Lack of proper blocking or resistance of the package to distortion is disclosed by the incline impact test. Heavy articles fastened to a crate base by insufficient metal was provided in the article to hold bolts."

"We feel that the test program is extremely valuable to the product designer as well as to the packaging engineer."

Earl R. Stivers
Rockaway, N. J.



Where you're buying sheets of various sizes you'll require about **30 percent more help** in your purchasing and inventory control departments.



And about **30 percent more space** in your warehousing set-up.

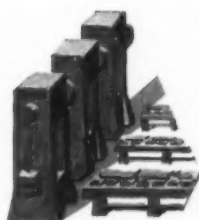


Then, if you further resquare to multiples in your own plant you're paying an **additional cost of at least \$.35 per hundred weight.**



Thus, prior to fabrication, you have added approximately **\$1.10** to every hundred pounds of steel, even though you are using plain light gauge metal.

LINE



range. The entire "extra" cost prior to fabrication here . . . just a fraction of the **\$1.00** plus per hundred weight cost of standard methods.



Wean

**COMBINATION
SLITTING and
SHEARING
SYSTEMS**

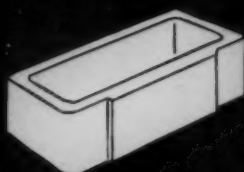
WEAN EQUIPMENT CORPORATION OFFICES

CHICAGO

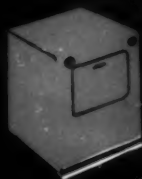
**CLEVELAND
NEWARK, N. J.**

DETROIT

Cable Address: WEANCOR



THERE'S NO COLOR SYSTEM LIKE TINT-TANIUMS



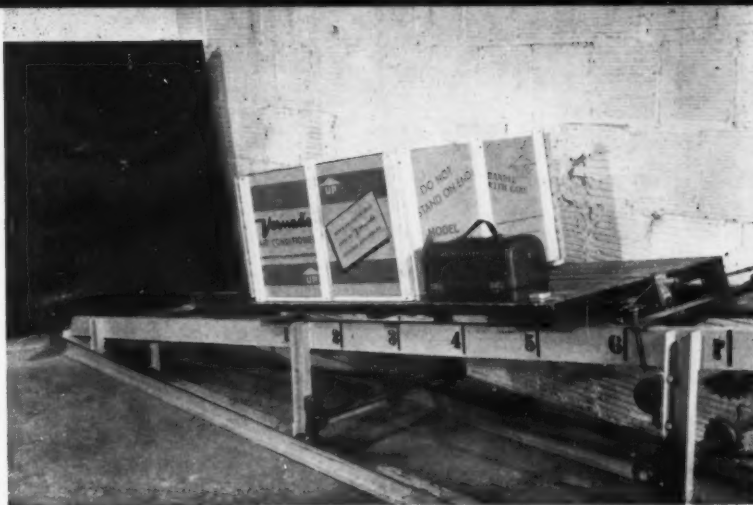
Tint-Taniums have firmly established themselves in regular daily production in some of the nation's most respected appliance manufacturing plants. These colored frits, made exclusively by Chicago Vit, provide a number of distinct production advantages foremost among them being unequalled color stability. They are handled as easily as white titanium frits, and completely eliminate the chance for human error that exists in systems where colors are added at the mill. Tint-Taniums also bring you economic advantages, and give your finished products fresh new sales appeal. So, if you plan to use colors in your new products, you'll find it profitable to choose Tint-Taniums. There's nothing else like them!

Chicago Vitreous CORPORATION
1425 South 55th Court • Cicero 50, Illinois

Love Box Company, Inc.

"Since the installation of our Safe Transit laboratory, we have been able to improve the packaging of our customers, without increasing their costs, by taking the practical approach and being able to simulate actual transit and handling conditions Our customers have benefited in a competitive market by having their products arrive ready to be used by the customer. It has been said: *A product is never sold until it is in satisfactory use by the customer.*"

Robert D. Love
Wichita, Kansas



Bigelow-Garvey Lumber Co.

"Through testing of product and package, we have been able to construct crates in such a manner that the initial cost to our customers has been reduced, and at the same time they have been able to improve the quality of their products."

"For instance, one of our customers, a manufacturer of bathtubs, has advised that through testing they were able to uncover various features of enameling that could be improved. We are also conducting periodic tests as an extra precaution in checking manufacturing quality."

J. P. Greco
Chicago, Ill.

L. A. B. Corporation

"Our laboratory has been set up for a very short period of time. Due to this fact, we do not yet have adequate records on the benefits of pre-shipment testing. However, we have manufactured vibration and impact package testing equipment for quite a few years, and statements from our customers reveal that the use of these machines is exceptionally helpful in reducing shipping damage. The equipment is also used extensively in quality control of the products themselves and in reducing package costs."

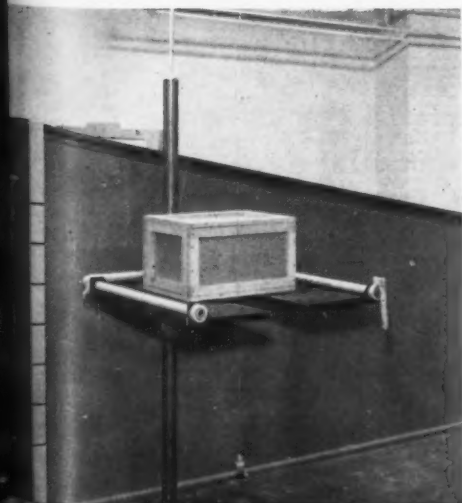
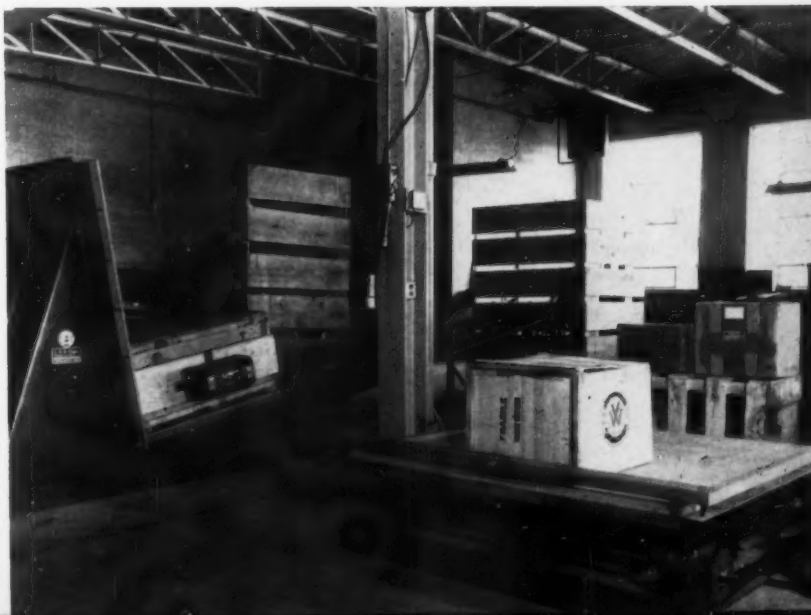
Gordon M. Richardson
Skaneateles, New York

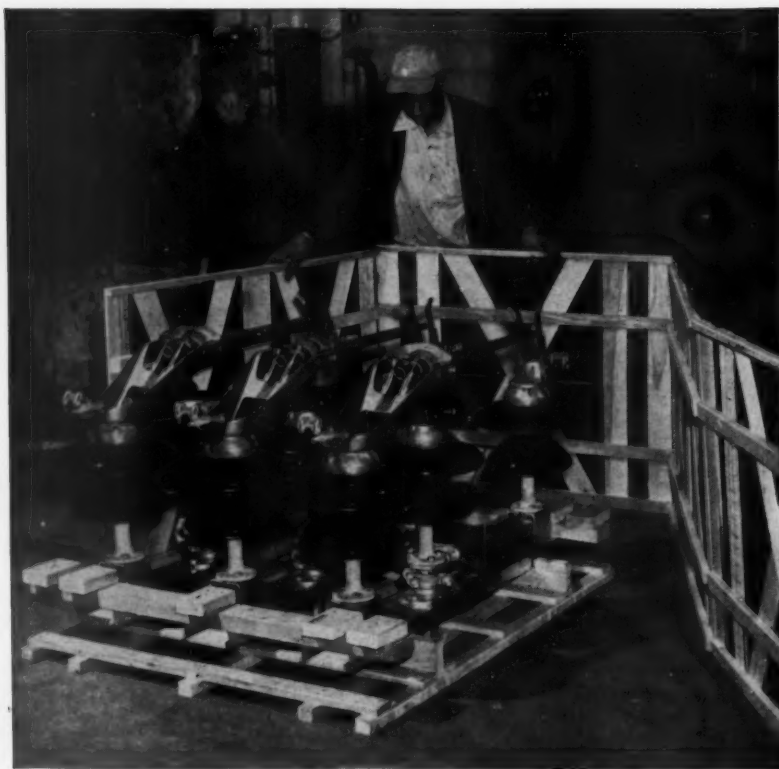
Packaging Service Company

"Our laboratory was one of the first to be certified by the NST committee Since that time our efforts have been rewarded. Much progress has been made in line with the educational aspects, bringing the program to the attention of manufacturers, plus the physical testing of his packaged products."

"Approximately 75% of our clients hesitate to purchase containers until NST tests have been conducted and passed."

J. C. Fleck
Willow Grove, Pa.





Switch is set in place by lift truck on pallet base specially designed to permit use of same crate for switches of two sizes. Wirebound mats wrap around easily, are secured in minutes.

Although 106 pounds lighter than previous container, which was custom built for each switch, rugged engineered wirebound permits fork lift handling and stacking of 759-lb. gross weight units.



Hold-down assembly, already in place here, goes on next. Then top is placed in position and nailed. All parts fit nicely, reinforcing each other for strength and easy assembly.



Prize-winning General-Engineered Wirebound Cuts Packing Time 85% for Delta Star



This wirebound crate won first award for excellence of design for Delta Star in the 1954 competition sponsored by the Society of Industrial Packaging and Material Handling Engineers, the 6th consecutive first for containers by General Box.

The change from a custom-built crate to a General wirebound design cut packaging time for high-voltage disconnect switches from 3½ hours to ½ hour and reduced gross shipping weight 106 pounds per unit—from 865 to 759 pounds. These important savings were accomplished by Delta Star Electric Division, H. K. Porter Company, Inc., of Pittsburgh.

Skilled labor was required to build the crates formerly used, while the precision-made parts of the new wirebound are put together by unskilled labor. A bit of ingenious design that makes the crate quickly adaptable to another size switch permits standardization. There is a further saving in the

lower cost of the materials in the General wirebound, an improvement in the degree of protection afforded—thanks to engineered and tested design—and an improvement in the appearance of the container.

Specialized experience and design and testing facilities unmatched in the industry are applied to the creation of custom-designed, volume-produced containers by General Box. To find out how much better your packaging can be, have a General man call. No obligation. Consult your local directory, or write direct. Ask for your free copy of illustrated booklet "The General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Prescott, Ark.; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

- Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

General Box

1823 Miner Street, Des Plaines, Illinois



High speed production line for water heaters

→ from Page 23

known, it is the only one of its type in existence.

After tapping, each body is hydro-tested at 350 psi on one of four test stands. The burners are installed at this point, and the body is ready to converge with the jacket line. Due to precision control throughout production, rejections at the water test stage are negligible.

The pre-sheared and pierce jacket blanks are roll-formed and box-seamed in a small area just in front of an automatic cleaning chamber. The rear part of this cleaning set-up contains a hot water rinse, and, by an ingenious arrangement, surplus heat from this hot water wash section is utilized in the drying chamber for the washed jackets. Beyond this drying chamber, the jackets travel directly into the electrostatic spray booth for painting.

In reality, it should not be called a "booth", for the rotary painting unit is actually installed in one corner of the paint room and partially walled off by small portable panels. One very small floor-level exhaust duct is employed. The overspray accumulation at the time this writer saw the installation was not sufficient to provide a good one-coat job on the floor or surrounding partitions. Except for the presence of the spray mist darting from the disc atomizer to the heater jackets, the air was clear.

The actuating mechanism for the

The
**National Safe Transit Program
Can Work For You**

**If you play your cards right
There's a profit, too.**

spraying unit is installed overhead at General Water Heater Corp. Vertical travel of the unit may be adjusted while it is operating to coincide with the vertical "hang" of the parts being

painted. A small paint booth just beyond the unit is used to "touch up" the few jackets that travel through the electrostatic booth while the Rans-

to Page ST-12 →

Loading outgoing truck from General Water Heater's permanent \$750,000 inventory of finished and crated water heaters.



181 Safe Transit Certifications

THE following companies are certified under the National Safe Transit Program.

A-B Stoves Division
Detroit-Michigan Stove Company
Detroit, Michigan

Ace Utilities, Inc.
Brooklyn, New York

Ackermann Manufacturing Company
Wheeling, West Virginia

Active Tool & Manufacturing Co.
Detroit, Michigan

Addison Products Company
Addison, Michigan

Admiral Corporation
Chicago, Illinois

AllianceWare, Inc.
Alliance, Ohio

Altorfer Bros. Company
Peoria, Illinois

America & Southern Corp.
Nashville, Tennessee

American Kitchens Division
Avco Mfg. Corp.
Connersville, Indiana

Andrew Corporation
Chicago, Illinois

Apex Electrical Manufacturing Co.
Cleveland, Ohio

Appliance & Electronics Division
Avco Manufacturing Corp.
Cincinnati, Ohio

Automatic Washer Company
Newton, Iowa

Barrows Porcelain Enamel Company
Cincinnati, Ohio

Beam Manufacturing Company
Division of Solar Corporation
Webster City, Iowa

The Bellaire Enamel Company
Bellaire, Ohio

Belmont Stamping & Enameling Co.
New Philadelphia, Ohio

Bendix Home Appliances
Division—Avco Mfg. Corp.
South Bend, Indiana

Ben-Hur Manufacturing Company
Milwaukee, Wisconsin

Berger Manufacturing Division
Republic Steel Corporation
Canton, Ohio

Boston Stove Foundry Company
Reading, Massachusetts

Bryant Heater Division
Affiliated Gas Equipment, Inc.
Cleveland, Ohio

Bryant Heater Division
Affiliated Gas Equipment, Inc.
Indianapolis, Indiana

Bryant Heater Division
Affiliated Gas Equipment, Inc.
Tyler, Texas

Brown Stove Works, Inc.
Cleveland, Tennessee

Calcinator Corporation
Bay City, Michigan

Caloric Stove Corporation
Topton, Pennsylvania

Canadian General Electric Co., Ltd.
Montreal, Quebec, Canada

Canadian Westinghouse Company, Ltd.
Hamilton, Ontario, Canada

Canton Stamping & Enameling Co.
Canton, Ohio

Central Rubber & Steel Corporation
Findlay, Ohio

Chambers Corporation
Shelbyville, Indiana

Chicago Electric Division
The Silex Company
Chicago, Illinois

Chicago Vitreous Corporation
Cicero, Illinois

Cincinnati Milling Products Division
Cincinnati Milling Machine Company
Cincinnati, Ohio

Clarostat Manufacturing Co., Inc.
Dover, New Hampshire

Clyde Porcelain Steel Division
Whirlpool Corporation
Clyde, Ohio

Conlon-Moore Corporation
Chicago, Illinois

Consolidated Industries, Inc.
Lafayette, Indiana

Continental Water Heater Co.
Los Angeles, Calif.

Cribben and Sexton Company
Chicago, Illinois

Crosley Division, Avco Mfg. Corp.
Richmond, Indiana

Crosley Division, Avco Mfg. Corp.
Nashville, Tennessee

Crown Stove Works
Chicago, Illinois

Crunden Martin Manufacturing Co.
St. Louis, Missouri

Davis Products Co.
Niles, Michigan

Day & Night Division
Affiliated Gas Equipment, Inc.
Monrovia, California

Dearborn Stove Company
Chicago, Illinois

Deepfreeze Appliance Division
Motor Products Corporation
North Chicago, Illinois

Detroit-Michigan Stove Company
Detroit, Michigan

The Dexter Company
Fairfield, Iowa

Dixie Products, Inc.
Cleveland, Tennessee

Dostal & Lowey Company, Inc.
Menomonee Falls, Wisconsin

The Duchess Company
Alliance, Ohio

Duo-Therm Division
Motor Wheel Corporation
Lansing, Michigan

Eagle Range & Mfg. Company
Belleville, Illinois

Easy Washing Machine Corporation
Syracuse, New York

The Enamel Products Company
Cleveland, Ohio

Fedders-Quigan Corporation
Buffalo, New York

Fedders-Quigan Corporation
Maspeth, Long Island, N. Y.

Federal Enameling & Stamping Co.
Pittsburgh, Pennsylvania

Firestone Steel Products
Akron, Ohio

Firestone Steel Products
Wyandotte, Michigan

The Fletcher Enamel Company
Dunbar, West Virginia

Florence Stove Company
Kankakee, Illinois

Florence Stove Company
Lewisburg, Tennessee

The Floyd-Wells Company
Royersford, Pennsylvania

Franklin Manufacturing Company, Inc.
Minneapolis, Minnesota

Frigidaire Division
General Motors Corporation
Dayton, Ohio

General Electric Company
Bloomfield, New Jersey

General Electric Company
Erie, Pennsylvania

Geneva Modern Kitchens, Inc.
Geneva, Illinois

Globe American Corporation
Kokomo, Indiana

Gray & Dudley Company
Nashville, Tennessee

Hardwick Stove Company
Cleveland, Tennessee

Haskell Manufacturing Co., Inc.
Pittsburgh, Pa.

Heintz Manufacturing Company
Philadelphia, Pennsylvania

Holland-Rieger Division
Apex Electrical Mfg. Co.
Sandusky, Ohio

Hotpoint Company
Chicago, Illinois

Ingersoll Products Division
Borg-Warner Corporation
Chicago, Illinois

Ingram-Richardson, Inc.
Frankfort, Indiana

International Harvester Company
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Jordon Refrigerator Co., Inc.
Philadelphia, Penna.

Kaiser Metal Products, Inc.
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Kelvinator Division
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Petaluma, California

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Mattoon, Illinois

Landers, Frary & Clark
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The Lennox Furnace Company
Marshalltown, Iowa

A. J. Lindemann & Hoverson Co.
Milwaukee, Wisconsin

Line Material Company
Division of McGraw Electric
Milwaukee, Wisconsin

Lisk-Savory Corporation
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Cleveland, Ohio

Magic Chef, Inc.
Lorain, Ohio

Magic Chef, Inc.
St. Louis, Missouri

Majestic Manufacturing Co.
St. Louis, Missouri

Malleable Iron Range Company
Beaver Dam, Wisconsin

Malsbary Manufacturing Co.
Oakland, California

Manitowoc Equipment Works
Manitowoc, Wisconsin

The Maytag Company
Newton, Iowa

McCray Refrigerator Company, Inc.
Kendallville, Indiana

A. Y. McDonald Manufacturing Co.
Dubuque, Iowa

Meadows Division, Thor Corporation
Bloomington, Illinois

Miami Products, Inc.
Miami, Oklahoma

Midwest Manufacturing Company
Division of Admiral Corp.
Galesburg, Illinois

Moffats, Limited
Weston, Ontario, Canada

The Moore Enameling & Mfg. Co.
West Lafayette, Ohio

Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Illinois

Murray Corporation of America
Scranton, Pennsylvania

Murray Manufacturing Company
Murray, Kentucky

Neon Products, Inc.
Lima, Ohio

Nesco, Inc.
Milwaukee, Wisconsin

Newark Stove Company
Newark, Ohio

Norge Division, Borg-Warner Corp.
Effingham, Illinois

Norge Division, Borg-Warner Corp.
Herrin, Illinois

Norge Division, Borg-Warner Corp.
Muskegon Heights, Michigan

Odin Stove Manufacturing Co.
Erie, Pennsylvania

O'Keefe & Merritt Company
Los Angeles, California

Payne Furnace Division
Affiliated Gas Equipment, Inc.
Monrovia, California

Peerless Manufacturing Corporation
Louisville, Kentucky

Perfection Stove Company
Cleveland, Ohio

Philco Corp., Refrigerator Division
Philadelphia, Pennsylvania

Porcelain Metals Corp. of Louisville
Louisville, Kentucky

Precision Grinding Wheel Co., Inc.
Philadelphia, Pennsylvania

Preway, Inc.
Wisconsin Rapids, Wisconsin

Quicfrez, Inc.
Fond du Lac, Wisconsin

Quincy Stove Mfg. Co.
Quincy, Illinois

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Speed Queen Corp., Ironer Division
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O. A. Sutton Corporation
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The Tappan Stove Company
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Nashville, Tennessee

Tennessee Stove Works
Chattanooga, Tennessee

Thor Corporation
Chicago, Illinois

Toledo Porcelain Enamel Products Co.
Toledo, Ohio

Trade-Wind Motorfans, Inc.
Los Angeles, California

United Specialties Company
Philadelphia, Pennsylvania

United States Rubber Company
Fort Wayne, Indiana

United States Rubber Company
Fulton, New York

United States Stamping Company
Moundsville, West Virginia

Universal Major Elec. Appliances, Inc.
Baltimore, Maryland

Victor Products Corporation
Hagerstown, Maryland

Westinghouse Electric Corporation
East Springfield, Mass.

Westinghouse Electric Corporation
Metuchen, New Jersey

Westinghouse Electric Corporation
Columbus, Ohio

Westinghouse Electric Corporation
Mansfield, Ohio

Westinghouse Electric Corporation
Beaver, Pennsylvania

Westinghouse Electric Corporation
Sharon, Pennsylvania

Westinghouse Electric Corporation
Sunbury, Pennsylvania

Westinghouse Electric Corporation
Raleigh, North Carolina

S. S. White Dental Mfg. Co.
Staten Island, New York

White Products Corporation
Middleville, Michigan

John Wood Company
Chicago, Illinois

John Wood Company
Conshohocken, Pa.

York Corporation
York, Pennsylvania

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burg unit is being adjusted. "We could re-route these few units for re-painting, but as the paint booth was already installed, we find it quicker merely to re-touch the first few jackets," the man in charge explained. "After the unit is adjusted, no touch-up work is necessary."

Scarff points out that coating thickness averages between 1.5 and 2 mils. "We obtain excellent consistency without runs or other mechanical

blemishes. We obtain a coverage of about 610 sq. ft. per gallon of paint as compared with 370 sq. ft. when conventional hand spraying equipment was employed. We also use the electrostatic unit for painting small heater parts. These are hung on Christmas tree-like racks which approximate the size of the water heater jackets."

Final assembly

After the water heater jackets are

painted and dried, they join the bodies at the beginning of the final assembly line. While water heater final assembly is pretty much a standardized process, with adequate test pits and testing facilities to check all working components as the heater travels along the line, the test pits at General Water Heater Corp. are far more roomy than usual. In fact, the tubing that is installed on the heater is actually cut to length and shaped right in the pit where it is used. This extra roominess was provided for a specific reason. When production warrants it, the opposite side of the pit will be used for a second final assembly line of large-size water heaters. In fact, the conveyor chain for this line is already installed.

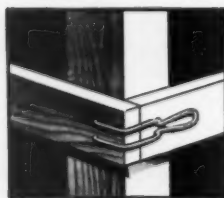
Officials at General Water Heater Corp. are very proud of the company's long record of service in the West Coast area. While to an Eastern manufacturer a 35-year life cycle might seem rather abbreviated, on the West Coast this same 35-year cycle spans the era between sectional isolationism and acceptance of West Coast industry into the integrated American industrial pattern.



It Costs Less TO USE BIGELOW-GARVEY WRAP-AROUNDS!

THEY'RE TIME SAVERS—BUILT STRONGER FOR SAFE SHIPPING, HANDLING AND STACKING

OPEN CORNER



CLOSED CORNER

B-G Designs Wrap-Around Tight-Corner Crates to fit *your* product and to give you an overall lower packing cost. Ideal crate for tall and bulky items—Water Heaters—Hot-Air Furnaces—Refrigerators, etc.

Pre-tested to meet handling and transportation hazards. Protects your product and saves money in your shipping and handling costs.

B-G Containers are delivered flat, in 3 completely assembled sections. Pre-drilled nail holes. Unique Tight-Corner feature. Palletized for fork-lift handling, saves time and storage space.

B-G handling and packaging engineers will gladly call to discuss your specific shipping problems. Please write. You'll profit by our 30 years experience.



MILLS: ARKANSAS GEORGIA WISCONSIN MINNESOTA ILLINOIS

always check **BG** Write for complete details and prices to... **BIGELOW-GARVEY** Phone Whitehall 4-5252
General Office and Laboratory **lumber company**
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Safe Transit News

SIPMHE NAMES EXECUTIVE

CHANGES

Earl B. Candell, General Electric Co., Cleveland, president of the Society of Industrial Packaging and Materials Handling Engineers, has announced the following changes in the line-up of officers:

John Mount, Insurance Co. of North America, formerly secretary, has been named vice-president, filling the unexpired term of A. C. McGeath, deceased.

Robert C. Cragg, Gould Storage Battery Corp., has been named secretary, succeeding Mount.

M. C. Weisenhorn, Jiffy Mfg. Co., was named treasurer, succeeding M. A. Grogel, who resigned.

W. B. Lincoln, Inland Container Corp., has been appointed a national director.

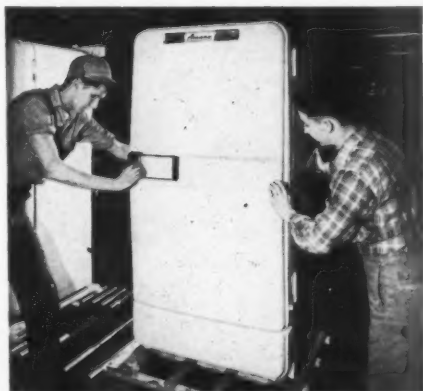
"Our face is our fortune,"

says *George C. Foerstner,*
Amana Executive Vice Pres.

"Or let's say it's a big part of our fortune," continues Mr. Foerstner.

"We prize the flawless finish of our Food Freezers highly — and so do housewives. In fact, as much care is taken in the manufacture of this finish as in any other part of the unit.

"We can't afford to have it marred after it leaves us. That's why we ship all our products in Atlas Plywood containers."



Gleaming beauty. Amana's pride in the shining finish of its Food Freezers is understandable. To protect these gleaming beauties which weigh 300 pounds, Amana sought the advice of Atlas Plywood packaging engineers. It was obvious that, if not properly packed for shipping, the weight could prove destructive when the unit underwent the jolts, bumps and strains of travel. What's more, the inside mechanism could be damaged.



Atlas Plywood Engineers designed this sturdy, lab-tested container that will absorb the shock of shipment, warehouse handling and dealer delivery.

Amana not only gains protection by this packaging but saves plenty of money besides; the container is light-weight as well as strong and its strength is so dependable Amana can now pack up to the load limits. No waste space in freight car or in storage.

What about you? Do you risk wasted dollars due to product damage or increased shipping costs from unreliable containers? Send for free informative, illustrated 24-page booklet, "How Atlas Plywood Cuts Your Shipping Costs . . . Safely," — or see your Atlas Plywood representative (Classified Telephone Directory). Learn about the remarkable testing laboratory where Atlas Plywood containers win their lab-tested label. Atlas Plywood Corporation, Dept. F-6, 1432 Statler Building, Boston 16, Massachusetts.

Atlas Plywood

CORPORATION

FROM AMERICAN FOREST TO FINISHED PRODUCT
PLYWOOD CONTAINERS • FLUSH DOORS • HARDWOOD PANELS



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Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS
"I saw your ad in finish"

Midwest Appliance Manufacturer desires young man with technical ceramic education and some experience in the field of sheet metal porcelain enameling. Expected to supervise all mill room functions and process control activities. Previous supervisory experience desirable.

Address reply to Box 255, c/o finish, York St. at Park Ave., Elmhurst, Ill.

GAMA outlook

→ from Page 132

sales volumes they expect to attain.

Sixth, additional advertising impact might be affected in various quarters of the industry, through the cooperative efforts of groups of manufacturers.

Seventh, the impetus of the Liquefied Petroleum Gas Association's advertising and public relations programs will have positive results on the sales of gas and gas burning equipment in the areas beyond the gas mains.

Eighth, the public relations programs being sponsored by the American Gas Association and by the Independent Natural Gas Association, which are in addition to the LPGA and GAMA programs, will make heavy contributions to market conditioning and public acceptance for both the fuel Gas, and gas appliances.

Ninth, the national advertising program of the A.G.A. and the furtherance of its PAR (Promotion, Advertising and Research) program will be continued with increased vigor.

Tenth, and what makes the previous elements cohesive and workable, is the record of mutual accomplishment and the practice of close cooperation between all parts of the gas industry which has been in clear perspective during recent years. This is particularly true in manufacturer-utility relationships.

So, from the over-all gas appliance and equipment viewpoint, the year ahead looks like a good one—not a spectacular one. As is the case with any given year, the net industry results will be in direct proportion with the efforts and accomplishment of the industry's individual components.